

DENDROTIIDAE (CRUSTACEA: ISOPODA) OF THE SOUTHEASTERN AUSTRALIAN CONTINENTAL SLOPE

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Abstract

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Four new species of *Acanthomunna* and four new species of *Dendrotion* are described from material collected from the southeastern Australian continental slope. *A. proteus* Beddard, 1886 is refigured. The new species of *Acanthomunna* represent the first records from Australian waters and the new species of *Dendrotion* represent the first records from waters of the Southern Hemisphere. A key to the genera of Dendrotiidae is presented along with keys to all described species of *Acanthomunna*, *Dendromunna* and *Dendrotion*. This paper highlights the rich dendrotiid fauna of the Australasian region with 10 of the 21 described species found between the Kermadec Trench in the South Pacific and the east coast of Australia. A table of habitat and distributional data for all described species of Dendrotiidae is presented.

Introduction

The crustacean fauna of the southeastern Australian continental shelf is species-rich (Barnard, 1991; Cohen and Poore, 1994; Poore and Wilson, 1993; Coleman et al., 1997) but before the survey by Poore and colleagues little was known of the small crustacean fauna of the continental slope. Poore et al (1994) found a rich isopod fauna on the southeastern continental slope, more diverse than that found on comparable slopes in the Atlantic, Arctic and Antarctic. Dendrotiid isopods are one of the families contributing to this diversity. This paper describing new species of dendrotiid isopods is based on the 'SLOPE' collection housed mostly at the Museum of Victoria (Poore et al., 1994).

Dendrotiid isopods are confined to the shelf and deep sea (130–4885 m, Table 1). Prior to this study 13 species in three genera had been described. In this paper four new species of *Acanthomunna* are described, the first records of the genus from Australian waters and increasing the number of described species world-wide from five to nine. *Acanthomunna proteus* Beddard, 1886, from New Zealand is refigured. Four new species of *Dendrotion* are also described. They are the first records of this genus from the Southern Hemisphere and increase the number of described species world-wide from five to nine.

Ten of the 21 species of Dendrotiidae now known are found between the Kermadec Trench in the South Pacific and the east coast of Australia; eight are found on the southeastern Australian continental slope.

Most of material on which this study is based has come from the southeastern Australian slope study, 1986 and 1988 (station prefix 'SLOPE') carried out by the Museum of Victoria (NMV), Melbourne (see Poore et al., 1994). Other material is from the Bass Strait Survey carried out by the Museum of Victoria and the Victorian Institute of Marine Science (Wilson and Poore, 1987), and from the Australian Museum (AM), Sydney and the Natural History Museum (BMNH), London.

The scale bar in the figures is 1 mm and refers to drawings of whole animals in dorsal view only. Figure labels are as follows: A1, A2, antenna 1 and 2; P1–7, pereopods 1–7; PL1–5, male pleopods 1–5; rMD, lMD, right and left mandible; MP, maxilliped; MX1, MX2, maxillae 1 and 2, and U, uropods. All illustrations are of the holotype unless otherwise stated.

The specific epithets of the new species are genera of Australian kangaroos and their relatives (Strahan, 1988) chosen only for their euphony, not to reflect any specific feature of either the isopod or the kangaroo. All are nouns in apposition.

Table 1. Distributional data for species of Dendrotiidae

Species	Locality	Depth (m)
<i>Acanthomunna proteus</i> Beddard, 1886	E of New Zealand, South Pacific	1281 and 2011
<i>A. spinipes</i> (Vanhöffen, 1914)	Off Antarctic Peninsula	385
<i>A. hystrix</i> (Hansen, 1916)	Iceland	1505
<i>A. beddardi</i> Menzies, 1962	South Atlantic	4885
<i>A. tannerensis</i> Schultz, 1966	Tanner Canyon, North Pacific	813
<i>A. bettongia</i> sp. nov.	Tasman Sea off Victoria and Tasmania	695–1264
<i>A. lagorchestes</i> sp. nov.	Tasman Sea from NSW to Bass Strait	130–429
<i>A. macropus</i> sp. nov.	Tasman Sea off NSW and Victoria	400–429
<i>A. potorous</i> sp. nov.	Tasman Sea off Point Hicks, Victoria	1840
<i>Dendromunna spinipes</i> Menzies, 1962	South Atlantic	1816
<i>D. mirabile</i> Wolff, 1962	Kermadec Trench, South Pacific	5230–5340
<i>D. compta</i> Lincoln & Boxshall, 1983	Rockall Trough, NE Atlantic	1271–2925
<i>Dendrotion spinosum</i> Sars, 1872	Hardanger Fjord, Norway	281
<i>D. paradoxum</i> Hansen, 1916	Iceland	1600
<i>D. hanseni</i> Menzies, 1956	Off Jamaica, Caribbean	1360
<i>D. setosum</i> Lincoln & Boxshall, 1983	Rockall Trough, NE Atlantic	1160 and 2076
<i>D. elegans</i> Lincoln & Boxshall, 1983	Rockall Trough, NE Atlantic	1600 and 2200
<i>D. onychogalea</i> sp. nov.	Tasman Sea off Point Hicks, Victoria	200–400
<i>D. peradarcus</i> sp. nov.	Tasman Sea off Victoria and Tasmania	500–2900
<i>D. petrogale</i> sp. nov.	Tasman Sea off NSW and Victoria	996 and 1277
<i>D. thylogale</i> sp. nov.	Tasman Sea from NSW to Tasmania	720–1840

Dendrotiidae Vanhöffen

Dendrotionidae Vanhöffen, 1914: 569.—Wolff, 1962: 64.—Lincoln and Boxshall, 1983: 298.

Munnini (part).—Hansen, 1916: 33.

Dendrotidae Menzies, 1962a: 28.

Dendrotionidae Menzies, 1962b: 167.

Dendrotiidae Bowman and Abele, 1982: 19.

Diagnosis. Antennae long and slender. Pereon bearing spines or long setae dorsally. Mouthparts generally not modified except maxilliped palp articles narrow. Pereopod 1 prehensile, shorter than 2–7. Pereopods 2–7 ambulatory, long and slender; pereopod 7 absent in some species. Coxal plates maybe visible dorsally, extended in some species into long lateral projections. Uropods large, biramous and inserted on dorsolateral surface of pleotelson. Uropod insertion point marked by large socket on the pleotelson. Pleotelson extending beyond insertion point of uropods. Anus opening into brachial chamber. Pleopods generally typical of Asellota except male pleopod 2 in some species with extremely long penial filament.

Remarks. Wilson (1976) removed *Munella* from Dendrotiidae into his newly erected family, Haplomunnidae. As Wilson (1976) argued, the three remaining dendrotiid genera form a strong family, all united by the possession of large uropods inserted on the dorsolateral surface of the pleotelson. Many specimens loose these massive uropods when they are captured and brought to the surface. No confusion with species of the genus *Munella* should arise because a large pair of sockets on the pleotelson indicate where dendrotiid uropods attach; species of *Munella* lack these large sockets.

Some confusion exists in the literature concerning the correct spelling of the family name Dendrotiidae. Bowman and Abele (1982) introduced the correct spelling (Dendrotiidae) without explanation. *Dendrotion* is probably a conjunction of *dendro-* (branching) and the Greek word *-otio*n (little ear). As family names are made of the Latinised genitive root, *oti-* in this case, the correct family name is Dendrotiidae (G.D.F. Wilson, pers. comm.).

Key to genera of Dendrotiidae

1. Cephalon with prominent lateral process supporting antennae; antenna 1 basal article elongate (more than 5 times as long as broad) *Dendrotion*
 — Cephalon without prominent lateral process supporting antennae; antenna 1 basal article not elongate (less than 2 times as long as broad).....2
2. Eyes present, pereon at most bearing many small spines, pereopod 7 present in adults..... *Acanthomunna*
 — Eyes absent, pereon bearing few large dorsolaterally directed spine-like processes, each bearing apical cluster of spines, pereopod 7 absent in adults.....
*Dendromunna*

Acanthomunna Beddard

Acanthomunna Beddard, 1886a: 102. Beddard, 1886b: 47.—Menzies, 1962b: 174.—Wolff, 1962: 65.—Schultz, 1966: 6.—Lincoln and Boxshall, 1983: 309.

Moromunna Vanhöffen, 1914: 569.

Pseudomunna Hansen, 1916: 47.

Type species. Acanthomunna proteus Beddard, 1886.

Diagnosis. Eyes present, located on small lateral protuberances. Cephalon broader than long, narrower than pereon. Antennae extremely long and slender. Antenna 1 basal article stout, not more than twice as long as wide; third basal article longer than first or second. Antenna 2 as long as animal and twice as long as antenna 1; peduncle articles 1–3 short, articles 1 and 2 with spiniform setae; peduncle articles 4 and 5 extremely long and slender. Pereon oval; 1.5 to 2 times as broad as long at broadest point; all pereonites and pereopods free and present. Mouthparts typical of Asellota, left mandible not stronger than right. Maxillipedal epipod broad and flat, distally tapered; endite internal margin reflexed; palp much narrower than endite, of 5 articles. Pereopod 1 prehensile, reflexed between carpus and propodus, shorter than other pereopods. Pereopods 2–7 ambulatory; long and slender, becoming successively more elongate; basis, ischium and merus compact, carpus and propodus greatly elongate; ischium to propodus articles with spiniform setae along anterior and posterior margins.

Male pleopod 1 subrectangular. Male pleopod 2 peduncle tapered; exopod bilobed. Some species, with extremely long appendix masculina. Uropods large and robust with numerous spiniform setae, inserted posterolaterally on dorsal surface; rami subequal, peduncle obvious.

Remarks. Prior to this study only 12 specimens of *Acanthomunna* had been collected, three of the five species known from only one specimen: *A. hystrix* (Hansen, 1916); *A. beddardi* Menzies, 1962; *A. tannerensis* Schultz, 1966. *A. proteus* Beddard, 1886 is known from two specimens and *A. spinipes* (Vanhöffen, 1914) known from seven. The four new species represent the first substantial collection of individuals of *Acanthomunna*. *A. bettongia* sp. nov. is represented by over 200 specimens and *A. lagorchestes* sp. nov. by over 100 specimens.

Wilson (1976) suggested a phylogeny of the Dendrotiidae and a closely related family, Haplo-munnidae. He argued that *Acanthomunna*, occurring in shallow waters, is the least derived genus of these two families because they have retained their eyes. The other genera have moved into deeper waters and lost their eyes. *A. lagorchestes* sp. nov. is the only dendrotiid recorded from less than 150 m (130–429 m, Table 1) although most individuals were caught around 400 m depth. *A. macropus* sp. nov. was also caught around 400 m (400–429 m). A fifth species of *Acanthomunna* was captured from 200 m (stn SLOPE 21, NMV J18589) but was too badly damaged to be described.

Key to species of *Acanthomunna*

1. Pereonites 3 and 4 with spiniform setae on middorsal surface.....2
 — Pereonites 3 and 4 devoid of setae on middorsal surface (may have small spines near lateral margins of dorsal surface).....5
2. Cephalon with spiniform setae.....3
 — Cephalon devoid of spiniform setae.....4
3. Spiniform setae branched.....*A. proteus* Beddard, 1886
 — Spiniform setae not branched.....*A. beddardi* Menzies, 1962

4. Pereonite 1 with a single row of 4–5 large spiniform setae..... *A. potorous* sp. nov.
 — Pereonite 1 with 2 rows of more than 5 large spiniform setae..... *A. tannerensis* Schultz, 1966
 5. Pereonite 1 with more than 8 dorsal spines..... *A. hystrix* (Hansen, 1916)
 — Pereonite 1 with 4 or fewer dorsal spines..... 6
 6. Pereonite 2 devoid of spiniform setae..... *A. bettongia* sp. nov.
 — Pereonite 2 with spiniform setae..... 7
 7. Pereonite 1 with 4 spines..... *A. spinipes* (Vanhöffen, 1914)
 — Pereonite 1 with 3 spines..... *A. lagorchestes* sp. nov.
 — Pereonite 1 with 2 spines..... *A. macropus* sp. nov.

Acanthomunna bettongia sp. nov.

Figures 1–3

Material examined. Holotype, Tasmania, 48 km ENE of Cape Tourville (42°00.25'S, 148°43.55'E), 1264 m, gravel with lumps of sandy mud aggregate, WHOI epibenthic sled, G.C.B. Poore et al on RV *Franklin*, 30 Oct 1988, stn SLOPE 81, NMV J36984 (female).

Paratypes. Type locality, NMV J36985 (1 male).

Victoria. S of Point Hicks (38°16.40'S, 149°27.60'E), 800 m, coarse shell, biogenic seds, WHOI epibenthic sled, M.F. Gomon et al on RV *Franklin*, 23 Jul 1986, stn SLOPE 34, NMV J36983 (1 female).

Other material. Tasmania. Off Freycinet Peninsula, WHOI epibenthic sled, M.F. Gomon et al. on RV *Franklin*, 27 Jul 1986 (42°2.20'S, 148°38.70'E), 800 m, coarse shelly sand, stn SLOPE 45, NMV J18572 (4); (42°0.20'S, 148°37.70'E), 720 m, coarse shelly sand, stn SLOPE 46, NMV J18573 (1). Type locality: NMV J18574 (63), NMV J18575 (64).

Eastern Bass Strait, naturalists' dredge, G.C.B. Poore on HMAS *Kimbla*, Mar 1979: 55 km NE of Babel Island (39°38.2'S, 148°49.2'E), 695 m, rock-sand-mud, stn BSS 34, NMV J18576 (10), NMV J18577 (10); 87 km ENE of North Point, Flinders I. (39°28.2'S, 148°52.4'E), 841 m, muddy sand, stn BSS 37, NMV J18578 (1).

Victoria. S of Point Hicks, WHOI epibenthic sled on RV *Franklin*, 23 Jul 1986: 38°21.90'S, 149°20.00'E, 1000 m, G.C.B. Poore et al., stn SLOPE 32, NMV J18568 (18); 38°19.60'S, 149°24.30'E, 930 m, rock, rubble, clay, sand, biogenic sediment, M.F. Gomon et al., stn SLOPE 33, NMV J18569 (16); 38°16.40'S, 149°27.60'E, 800 m, coarse shell, biogenic sediments, M.F. Gomon et al., stn SLOPE 34, NMV J18570 (8), NMV J18571 (7).

Description. Total length of holotype 2.94 mm. Cephalon subrectangular, twice as long as wide; anterior margin with middorsal notch between base of antenna, covered with many fine scales. Antenna 1 flagellum with 10 articles with 9 aesthetascs located on all flagellum articles except basal three. Antenna 2 flagellum with numerous articles of subequal sizes.

Pereon oval, widest at pereonite 3. Pereonites 1–4 separated by narrow dorsal sulcus;

pereonites 5–7 compressed, successively becoming more posteriorly projected. Pereonites 2–4 with short spine-like extensions of posterior lateral margins. Lateral margins of pereonite 7 hidden dorsally by pleotelson; coxae visible dorsally on other pereonites, some with small tapered projections. Lateral margins of pereonites and coxae with numerous fine scales as found on anterior margin of cephalon. Pereonite 1 with transverse dorsal ridge supporting 2 diverging anterolateral spines and a bifid anteriorly directed middorsal spine; remaining pereonites smooth, devoid of obvious spination.

Pleonites fused to pleotelson. Pleotelson subtriangular, 1.2 times longer than wide; with pair of large anteriorly directed spines on anterior third of dorsal surface and a sulcus running along lateral margin to posterolateral bosses which support uropods; ventrolateral margins with 3 short spiniform setae; posterior margin with a pair of minute spiniform setae laterally and a crenulate margin between setae, extending beyond uropodal bosses.

Left mandibular incisor process 3-dentate, lacinia mobilis 2–3-dentate; right mandibular incisor process 4–5-dentate. Left mandibular spine row with 9 armed spines; right mandibular spine row with 9 armed spines. Left mandibular molar broad, flat, positioned against lacinia mobilis; with 5 spiniform setae. Right mandibular molar broad and concave; with numerous spiniform setae. Mandibular palp of 3 elongate articles, typical. Maxilla 1 outer lobe bearing 11 stout spines, 7 denticulate; inner lobe with numerous setae. Maxilla 2 with stout setae on all lobes; outer lobe with 2 simple and 2 denticulate setae; middle lobe with 1 simple and 2 denticulate setae and inner lobe with 5 denticulate setae. Outer and middle lobes with a row of simple setae on inner lateral margins. Maxilliped with 3 coupling hooks; endite distal margin with 7 denticulate setae.

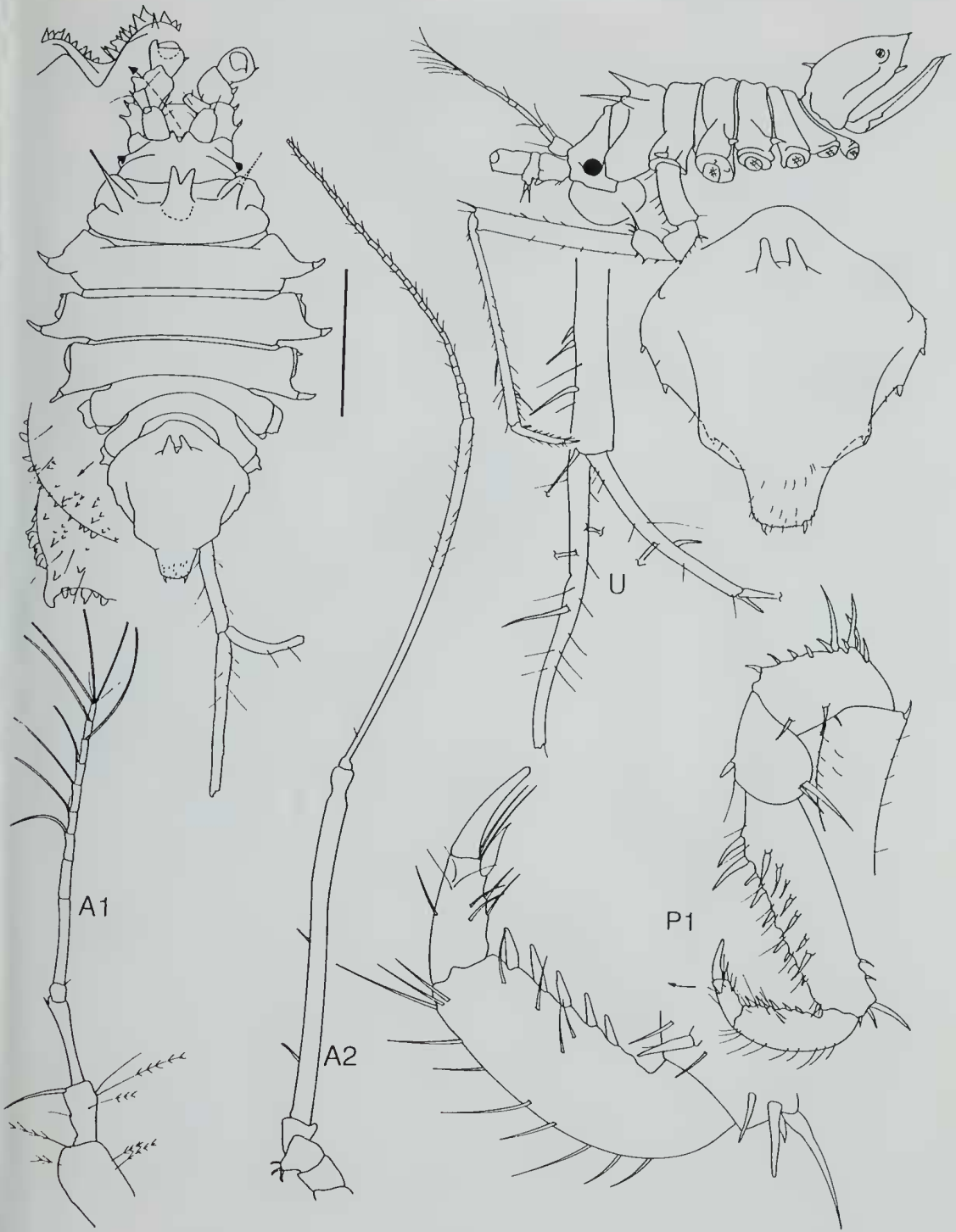


Figure 1. *Acanthomunna bettongia*. Holotype NMV J36984; A2 of paratype NMV J36983.

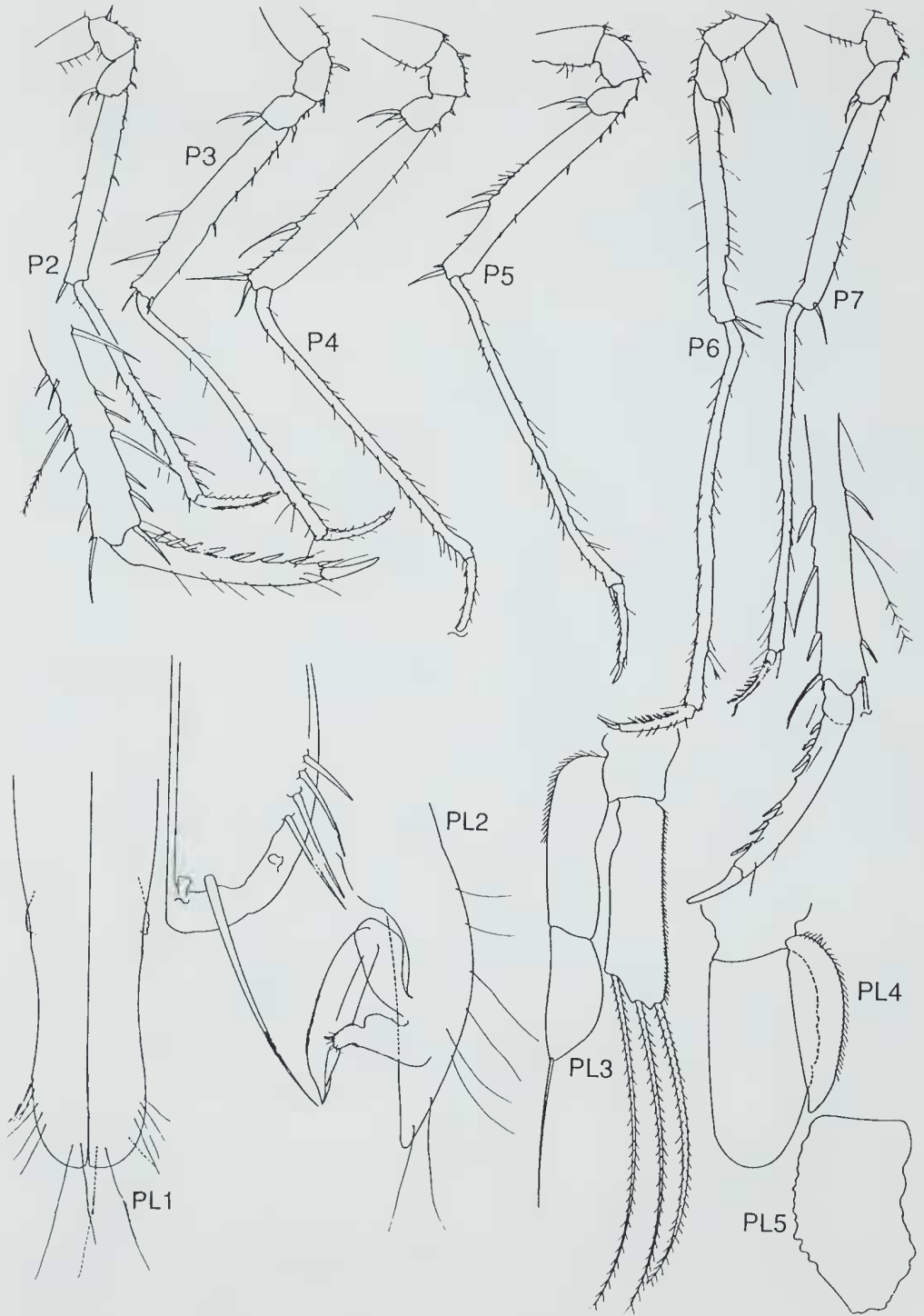


Figure 2. *Acanthomunna bettongia*. Holotype NMV J36984; PL1-5 of paratype NMV J36985.

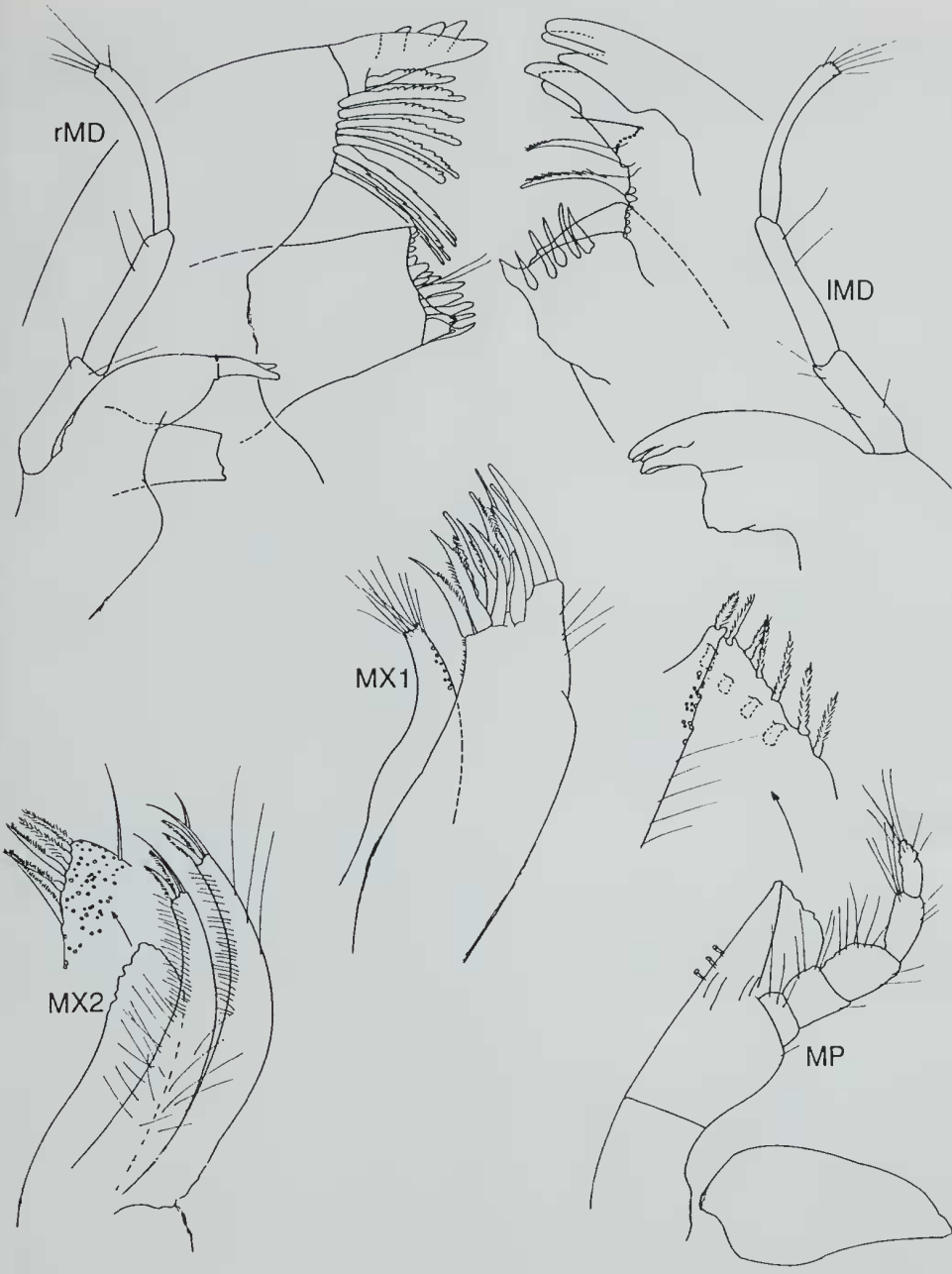


Figure 3. *Acanthomunna bettongia*. Holotype NMV J36984.

Pereopod 1 propodus with row of 5 stout setae on posterior margin; carpus with 2 rows of stout setae; other articles also with spiniform setae. Pereopods 2–7 typical, merus and carpus with large stout setae and dactylus with 7–8 spiniform setae posteriorly.

Male pleopod 1 with rounded distal margin bearing 7–8 long setae on each side. Male pleopod 2 proximal lobe small, knob shaped; distal lobe setose; appendix masculina (endopod) small, not reaching end of peduncle. Pleopod 3 endopod reaching beyond first article of exopod, with 3 long compound setae distally; exopod with 1 long setae. Pleopod 4 endopod longer than exopod and 2–3 times as broad. Pleopod 5 with no rami, lateral and distal margins crenulate. Uropod typical; exopod as long as peduncle, endopod one third longer than exopod.

Distribution. Tasman Sea off Victoria and Tasmania, 695–1264 m depth.

Remarks. *Acanthomunna bettongia* is most readily identified by the bifid, anteriorly directed middorsal spine on pereonite 1 and the pair of anteriorly directed large spines on anterior third of dorsal surface of the pleotelson. *A. bettongia* appears to be a common species on the upper continental slope of southeastern Australia. Over 200 specimens were collected from the SLOPE survey.

Acanthomunna lagorchestes sp. nov.

Figures 4–6

Material examined. Holotype. S of Point Hicks (38°17.70'S, 149°11.30'E), 400 m, coarse sand, gravel, mud, many sponges, WHOI epibenthic sled, M.F. Gomon et al. on RV *Franklin*, 24 Jul 1986, stn SLOPE 40, NMV J36980 (female).

Paratypes. Victoria. Type locality, NMV J36982 (1 male).

New South Wales. 44 km E of Nowra (34°55.79'S, 151°08.06'E), 429 m, muddy coarse shell, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 22 Oct 1988, stn SLOPE 56, NMV J36981 (1 female).

Other material. New South Wales. Off Nowra, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*: 34°59.52'S, 151°5.94'E, 204 m, coarse shell, 14 Jul 1986, stn SLOPE 1, NMV J18579 (1); 34°55.79'S, 151°08.06'E, 429 m, muddy coarse shell, 22 Oct 1988, stn SLOPE 56, NMV J18581 (37), NMV J18582 (38).

Tasmania. Eastern Bass Strait, 100 km NE of North Point, Flinders I. (38°52.6'S, 148°25.2'E), 130 m, fine sand, R.S. Wilson on RV *Tangaroa*, 15 Nov 1981, stn BSS 170, NMV J18583 (2).

Victoria. Type locality, NMV J18580 (20), 50 km S of Mallacoota (38°06.2'S, 149°45.5'E), 188 m, WHOI epibenthic sled, R.S. Wilson on RV *Soela*, 14 Oct 1984, stn S05/84/30, NMV J18584 (1).

Description. Total length of holotype 2.20 mm. Cephalon quadrate, as long as wide; anterior margin straight, produced between base of antenna. Antenna 1 flagellum with 5 articles with 3 aesthetascs located on 3 distal articles. Antenna 2 flagellum with 18 articles.

Pereon oval, widest at pereonite 3. Pereonites 1–4 with narrow dorsal sulcus separating pereonites; pereonites 5–7 compressed, successively becoming more posteriorly projected. Lateral margins of pereonite 7 hidden dorsally by pleotelson; coxae visible dorsally on other pereonites, all with small lateral projections. Pereonite 1 with middorsal ridge supporting 3 small spines; pereonite 2 with middorsal ridge with six small projections which appear to be the attachments for setae; remaining pereonites smooth, devoid of obvious dorsal spination or setae. All pereonites except pereonite 7 with 1 or 2 pairs of small projections near lateral margins.

Pleonite 1 visible, pleonites 2–5 fused to pleotelson. Pleotelson subtriangular ventrally with pronounced posterolateral bosses protruding dorsally; 1.1 times longer than wide; distal margin rounded; devoid of any spination or setae.

Left mandibular incisor process 6–7-dentate, lacinia mobilis 1–2-dentate; right mandibular incisor process 4-dentate. Left mandibular spine row with 3 spines, simple; right mandibular spine row with 5 spines, most armed. Left mandibular molar broad and flat, split into two. Right mandibular molar broad and flat. Mandibular palp represented by single setae. Maxilla 1 outer lobe with 9 visible stout spines, 3 denticulate; inner lobe with numerous setae. Maxilla 2 with stout setae on inner lobe; outer and middle lobes with a row of simple setae on inner lateral margins. Maxilliped with 2 coupling hooks; endite distal margin with 6 denticulate setae.

Pereopod 1 propodus with row of 4 stout setae on posterior margin; carpus with stout setae on both margins; other articles also supporting a few spiniform setae. Pereopods 2–7 typical, merus and carpus with large stout setae and dactylus with 5–6 spiniform setae posteriorly.

Male pleopod 1 with rounded distal margin bearing 14 long setae on each side distal to oblique groove. Male pleopod 2 proximal lobe as a small rounded knob, distal lobe setose; appendix masculina (endopod) not long, extending just beyond peduncle. Pleopod 3 endopod reaching half way along second article of exopod, with 3 long compound setae distally; exopod with 1 long setae. Pleopods 4–5 similar to *A. bettongia* but with concaved depression centrally; pleopod 5 margins smooth. Uropod typical; endopod one

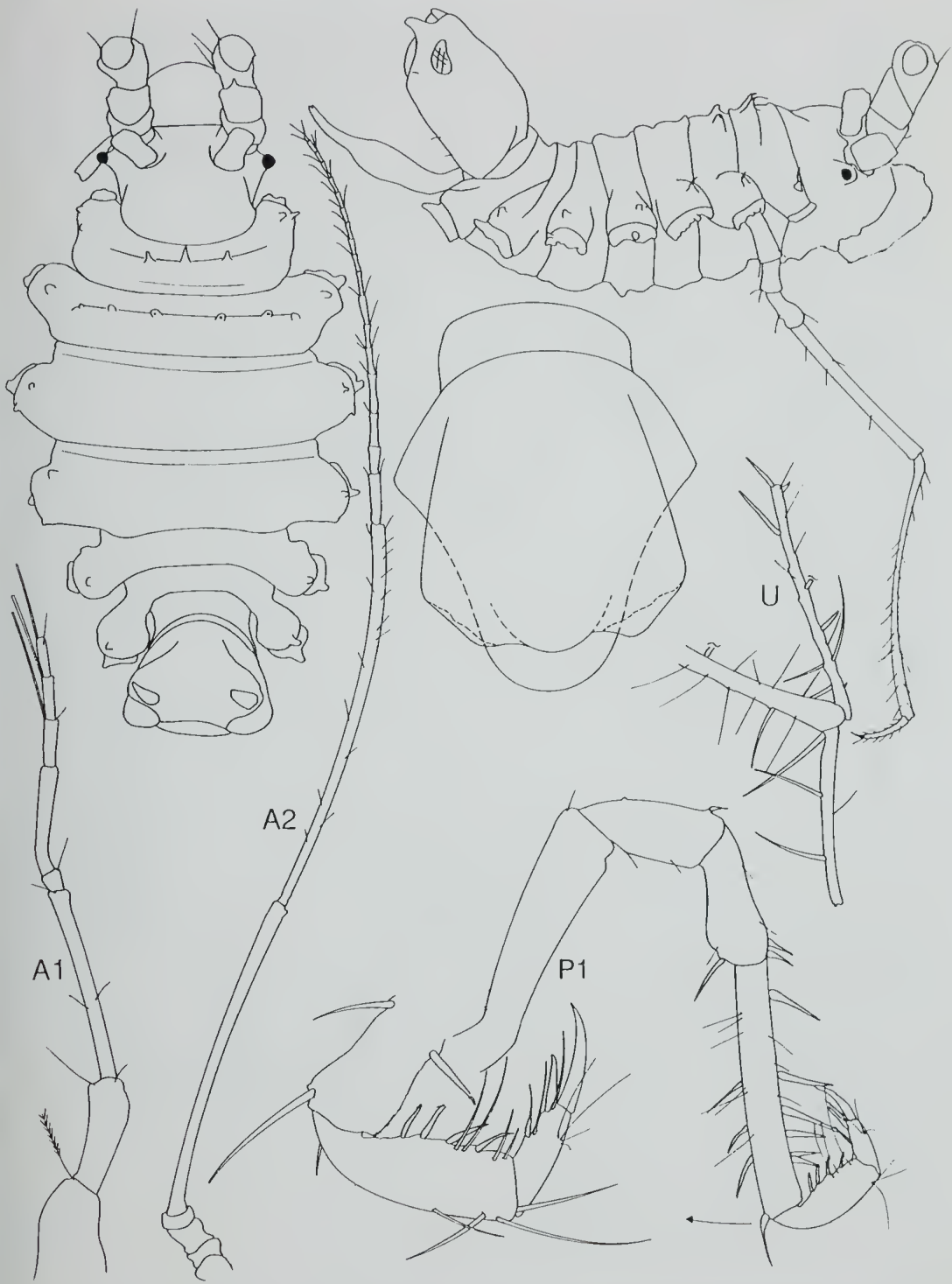


Figure 4. *Acanthomunna lagorchestes*. Holotype NMV J36980; U, P1, A1 and A2 of paratype NMV J36981.

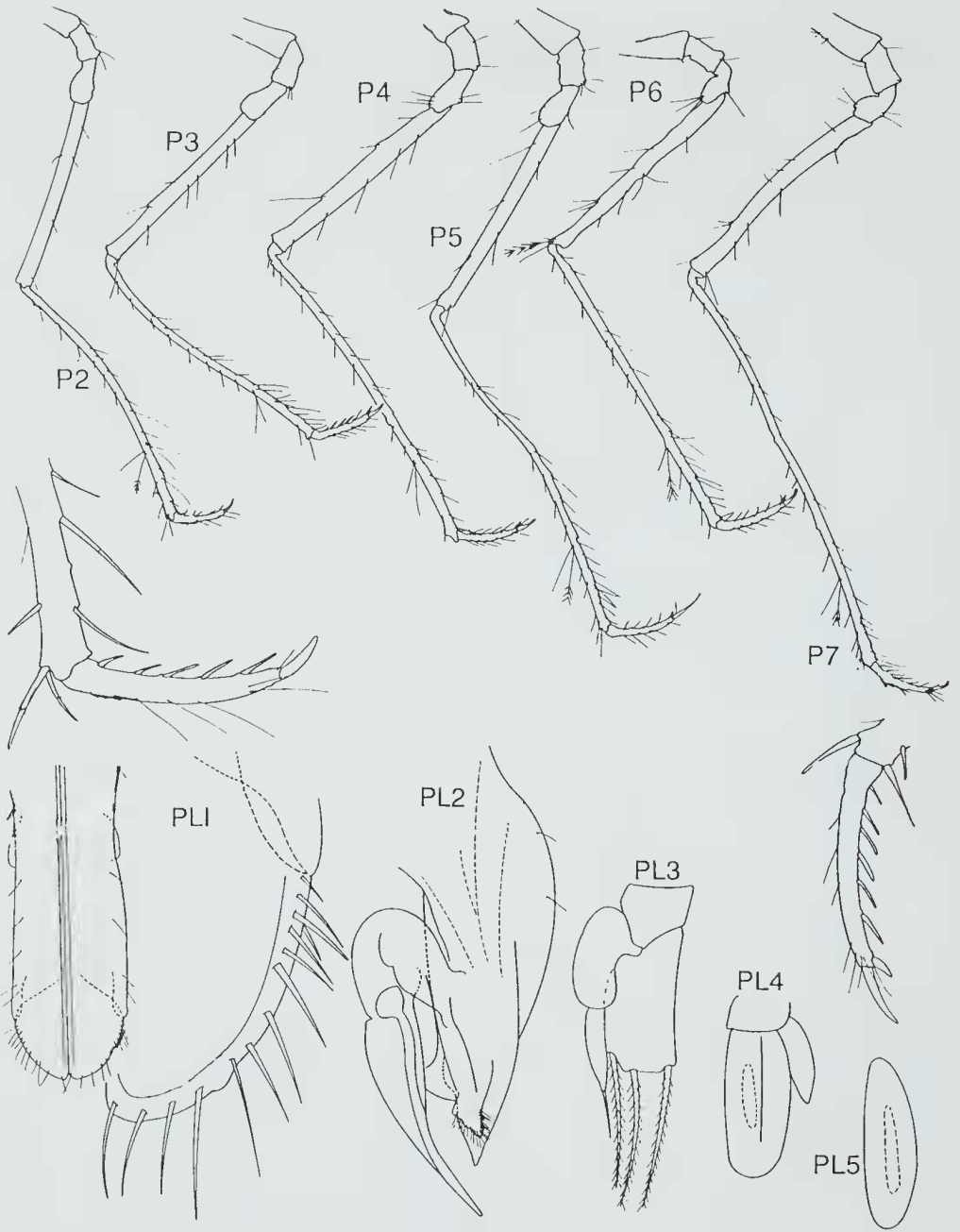


Figure 5. *Acanthomunna lagorchestes*. P2-6 of paratype NMV J36981; PL1-5 of paratype NMV J36982.

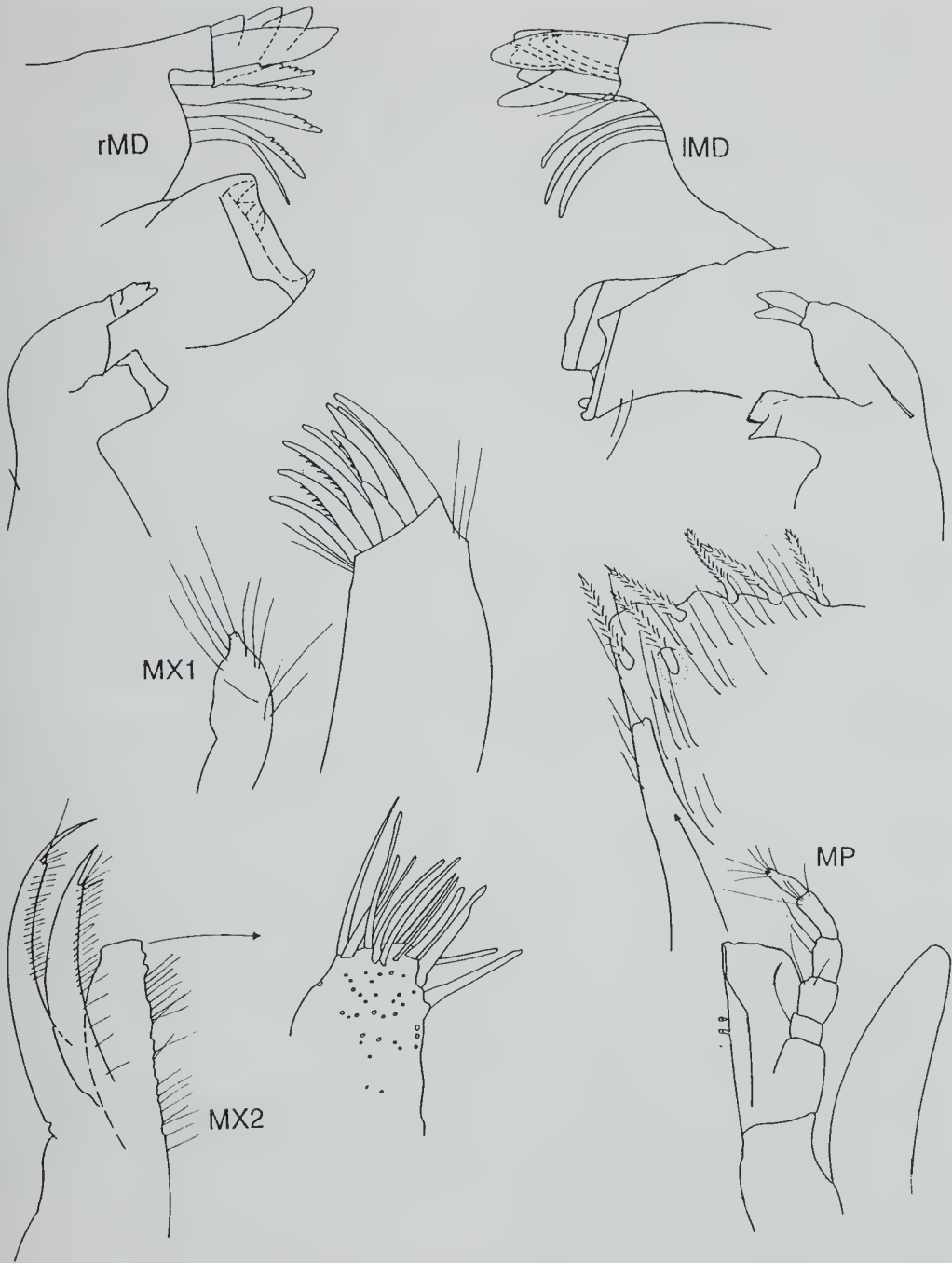


Figure 6. *Acanthomunna lagorchestes*. Paratype NMV J36981.



Figure 7. *Acanthomunna macropus*. Holotype NMV J36977.

quarter longer exopod; peduncle as large as endopod.

Distribution. Tasman Sea from NSW to Bass Strait, 130–429 m depth.

Remarks. *Acanthomunna lagorchestes* and *A. macropus* sp. nov. appear to be closely related species because they share many similarities, including their small size; pereonites with rounded lateral margins; pereonites 3–7 and pleotelson devoid of setae on middorsal surface and similarly shaped pleotelsons. *A. lagorchestes* is distinguishable by the greater pattern of spination on pereonites 1 and 2. *A. lagorchestes* appears to be a common species on the upper continental slope of southeastern Australia with over 100 specimens collected on the SLOPE survey.

Acanthomunna macropus sp. nov.

Figures 7–9

Material examined. Holotype. New South Wales. 44 km E of Nowra (34°55.79'S, 151°08.06'E), 429 m, muddy coarse shell, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 22 Oct 1988, stn SLOPE 56, NMV J36977.

Paratype. Type locality, NMV J36978 (1 female).

Victoria. S of Point Hicks (38°17.70'S, 149°11.30'E), 400 m, coarse sand, gravel, mud, many sponges, WHOI epibenthic sled, M.F. Gomon et al. on RV *Franklin*, 24 Jul 1986, stn SLOPE 40, NMV J18585 (1 male).

Other material. Type locality, NMV J18586 (3), NMV J18587 (1).

Description. Total length of holotype 1.67 mm. Cephalon subrectangular, twice as long as wide; anterior margin extended, straight with a pair of rounded projections at base of antennae. Antenna 1 flagellum with 6 articles with 3 aesthetascs located on 2 most distal articles. Antenna 2 flagellum with 27 articles, first article small.

Pereon oval, widest at pereonite 3. Pereonites 1–4 longer than 5–7; pereonite 5 compressed with concave posterior margin; pereonites 6–7 compressed more than pereonite 5. Lateral margins of pereonites 5–7 increasingly projected posteriorly; lateral margins of pereonite 7 dorsally hidden by pleotelson. Pereonite 1 with middorsal ridge supporting 2 small spines; pereonite 2 with middorsal ridge with 3 small projections which appear to be the attachments for setae; remaining pereonites smooth, devoid of dorsal spination or setae. Posterior margin of pereonites 2 and 3 overlapping slightly the following pereonites. All pereonites except pereonite 7 with 1 or 2 pairs of projections on lateral margins, coxae with similar lateral projections.

Pleonite 1 free, remaining fused to pleotelson. Pleotelson subtriangular ventrally with pronounced posterolateral bosses protruding dorsally; one quarter longer than wide; raised mid-dorsally; devoid of any spination or setae dorsally; posterior margin rounded extending between posterolateral bosses which support the uropods, posterior and lateral margins fringed with short setae.

Left mandibular incisor process 1–2-dentate, lacinia mobilis 4–5-dentate; right mandibular incisor process 4-dentate. Left mandibular spine row with 5 spines; right mandibular spine row with 5 armed spines. Left mandibular molar broad with 3 spiniform setae. Right mandibular molar broad, flat. Mandibular palp absent. Maxilla 1 outer lobe with 11 stout spines, 5 denticulate; inner lobe with numerous setae. Maxilla 2 with 6 denticulate setae on inner lobe; outer and middle lobes with a row of simple setae on inner lateral margins. Maxilliped with 2 coupling hooks; endite distal margin with 8 denticulate setae.

Pereopod 1 propodus with row of 4 stout setae on posterior margin; carpus with stout setae on both margins; other articles also supporting a few setae. Pereopods 2–7 typical, merus and carpus with large stout setae and dactylus with 5–6 spiniform setae posteriorly.

Male pleopod 1 with rounded distal margin bearing 11 long setae on each side distal to oblique groove. Male pleopod 2 proximal lobe knob shaped, distal lobe setose; appendix masculina (endopod) not long, extending a little beyond peduncle. Pleopod 3 endopod reaching beyond first article of exopod, with 3 long compound setae; second article of exopod missing. Pleopods 4–5 similar to *A. bettongia* but with concave depression centrally; pleopod 5 margins smooth. Uropods missing, thought large and inserted dorsolaterally on pleotelson.

Distribution. Tasman Sea off NSW and Victoria, 400–429 m depth.

Remarks. *A. macropus* is the smallest species of *Acanthomunna* described. It is most easily distinguished by the two plus three pattern of spination on pereonites 1 and 2.

Acanthomunna potorous sp. nov.

Figures 10–12

Material examined. Holotype. 76 km S of Point Hicks (38°29.33'S, 149°19.98'E), 1840 m, sandy mud, fine shell, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 26 Oct 1988, stn SLOPE 69, NMV J36986 (male).

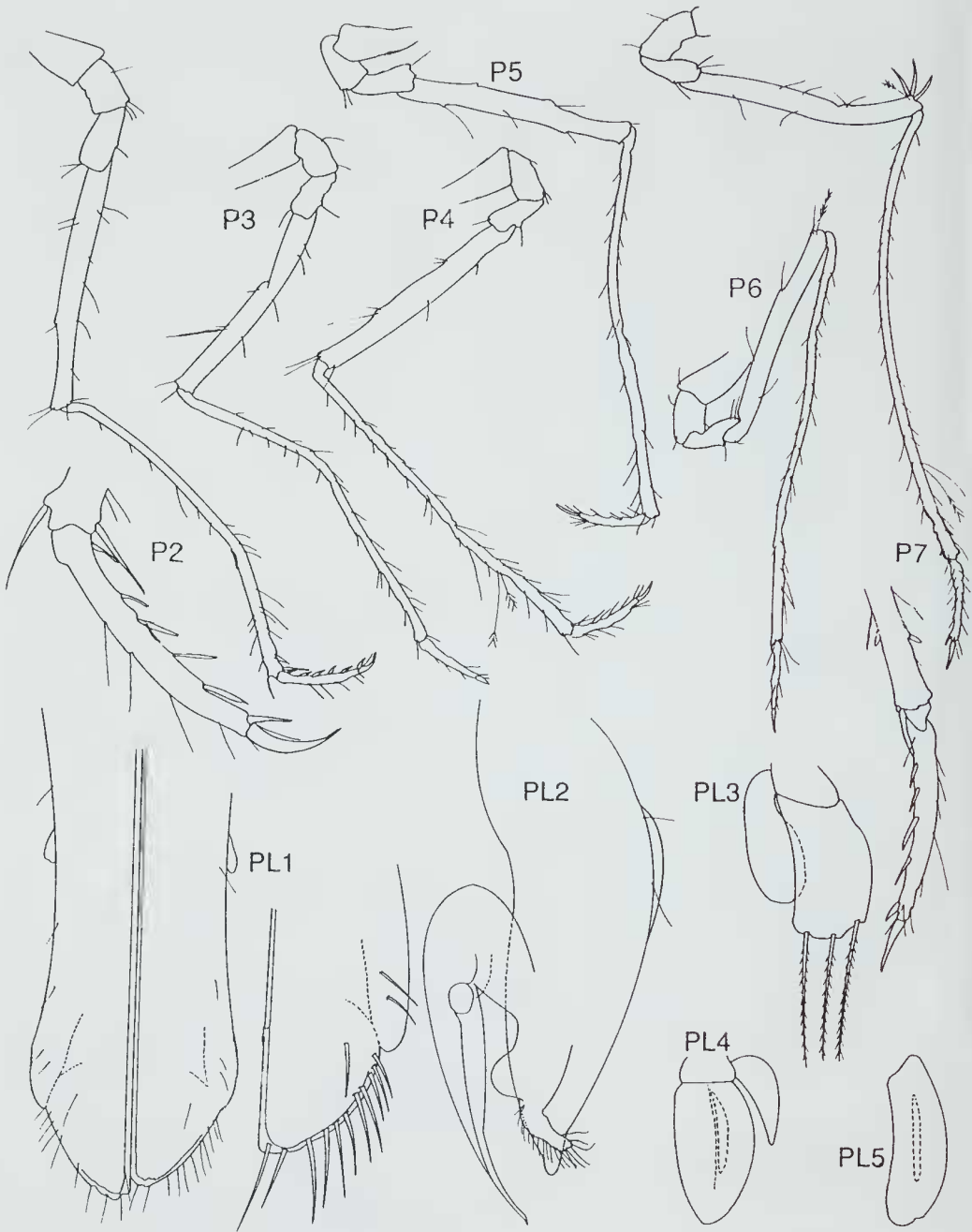


Figure 8. *Acanthomunna macropus*. Paratype NMV J18585.

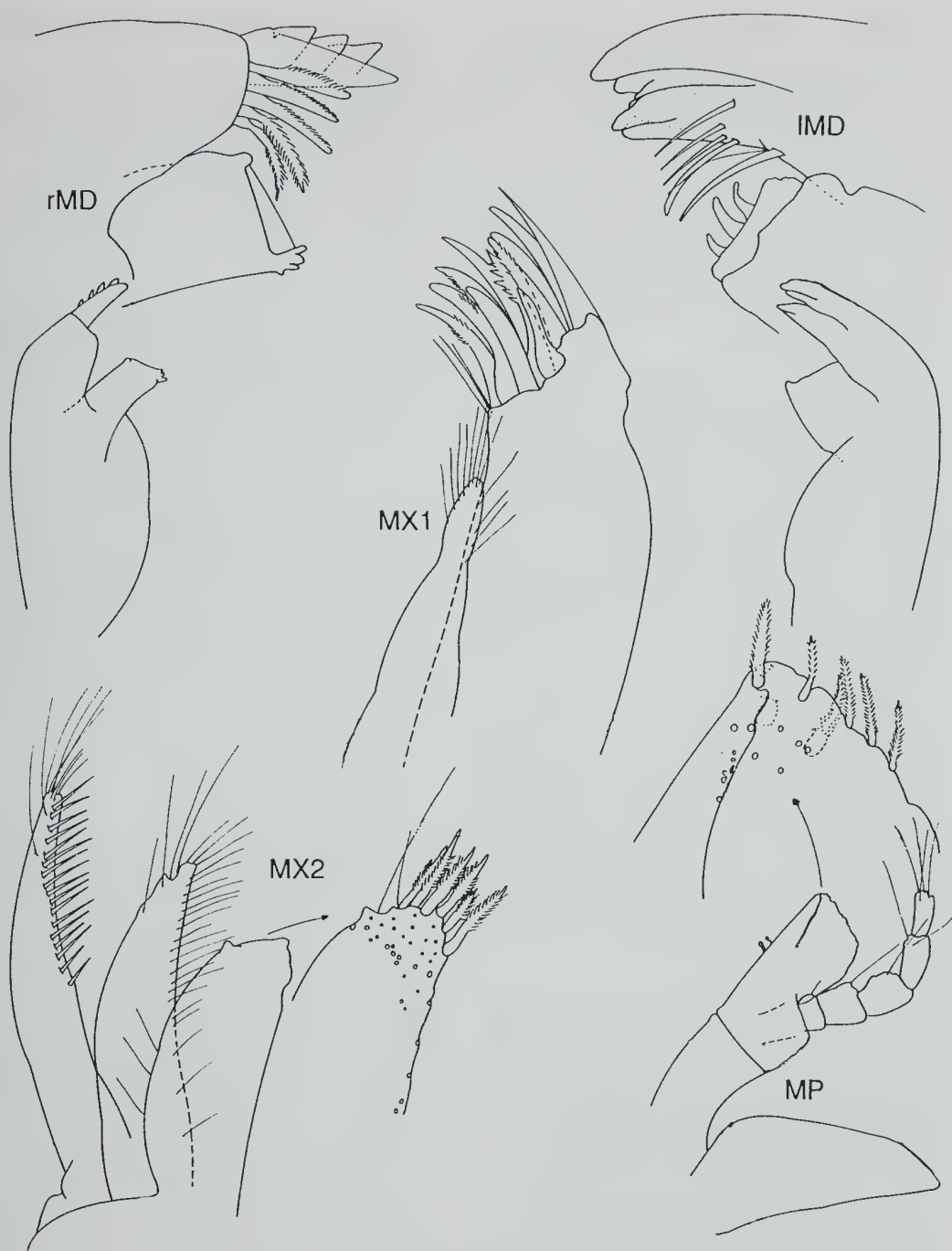


Figure 9. *Acanthomunna macropus*. IMD, MX1, MX2 and MP of paratype NMV J18585; rMD of paratype NMV J36978.

Paratypes. Tasmania, E of Cape Barren I., 40°45.94'S, 149°01.62'E, mud, 2500–2400 m, WHOI epibenthic sled, P. Hutchings, W. Ponder and R. Springthorpe, 10 Dec 1986, stn FR1086-4, AM P52116 (1); NMV J41663 (11).

Other material. Type locality, NMV J18588 (3).

Description. Total length of holotype 4.54 mm. Cephalon subrectangular, twice as long as wide; anterior margin produced between antennae. Antenna 1 flagellum with 26 articles with 21 aesthetascs located on all but proximal 3 articles; second flagella article much longer than others. Antenna 2 missing.

Pereon oval, broadest through pereonites 2–4. Lateral margins of pereonites 5–7 successively becoming more posteriorly projected; lateral margins of pereonite 7 hidden dorsally by pleotelson. Pereonite 1 with middorsal ridge supporting 5–6 large articulated, spiniform setae; pereonites 2–4 with 2 rows of articulated, spiniform setae, anterior row with 4–6 large setae and posterior row with 4–10 smaller setae; remaining pereonites smooth, devoid of setae. All pereonites with 1 or more articulated, spiniform setae on lateral margins; coxae with many sharp projections and articulated setae.

Pleonite 1 free, others fused with pleotelson; devoid of setae. Pleotelson oval with posterior margin extending out beyond uropodal bosses as a subrectangular projection; with numerous articulated spiniform setae arranged into three groups, a middorsal group with 7 large setae separated from the lateral group by a shallow inverted U-shaped sulcus. Lateral clusters of large setae arranged mostly along the margins of the pleotelson and separated by a shallow sulcus running towards the posterolateral bosses which support the uropods.

Left mandibular incisor process 5-dentate, lacinia mobilis 4-dentate; right mandibular incisor process 5-dentate. Left mandibular spine row with 9–10 spines, mostly armed; right mandibular spine row with 12 armed spines. Left mandibular molar broad and tapered with setae confined to posterior end. Right mandibular molar broad, slightly concave with 6 large setae and at least 3 teeth. Mandibular palp large, 3-articled. Maxilla 1 outer lobe with 11 stout spines, 7 denticulate; inner lobe with 5 spiniform setae and numerous other setae. Maxilla 2 with 14 denticulate setae on inner lobe: outer and middle lobes with 2 denticulate setae and row of simple setae on inner lateral margins. Maxilliped with

4 coupling hooks; endite distal margin with 15 denticulate setae.

Pereopod 1 propodus with row of 6 stout setae on posterior margin; carpus with 2 rows of stout setae on posterior margins; other articles also supporting a few setae. Pereopods 2–5 typical, some basis with setae; merus and carpus with large stout setae and dactylus with 4–5 spiniform setae posteriorly; pereopods 6 and 7 missing from holotype.

Male pleopod 1 with acute distolateral lobe proximal to flat distal margin; a single spiniform setae partially hidden by distolateral lobe and 3–4 pairs of spiniform setae in proximal third of pleopod. Distal margin bearing many long setae with another cluster of long setae laterally at base of distolateral lobe. Male pleopod 2 proximal lobe distally folded, distal lobe elongate and heavily setose, extending well beyond peduncle; appendix masculina (endopod) extremely long, approximately 3 times length of peduncle and protruding beyond pleotelson. Pleopod 3 endopod reaching just beyond first article of exopod, with 3 compound setae distally; external lateral area scabrous; second article of exopod with a single distal setae. Pleopods 4–5 similar to *A. bettongia*, with concave depression which fit together with pleopod 3. Uropods missing, thought large and inserted on dorsal surface of pleotelson.

Distribution. Tasman Sea off Point Hicks, Victoria, 1840 m depth.

Remarks. A species-complex based around *A. proteus* Beddard, 1886 and including *A. beddardi* Menzies, 1962 and *A. potorous* can be recognised. Notable characteristics shared by this species complex include: dorsally pereonites 3 and 4 with articulated spiniform setae, often in multiple rows; pleotelson also with numerous articulated spiniform setae dorsally; pleotelson with a straight to concave posterior margin and extremely long appendix masculina protruding beyond pleotelson. The only known specimen of *A. tannerensis* Schultz, 1966 is female. The features of the male pleopods of *A. tannerensis* can not therefore be confirmed but the shape of the posterior margin of the pleotelson and pattern of dorsal spination suggest that *A. tannerensis* also belongs to this complex. *A. potorous* is easily distinguishable from the other members of this complex because its cephalon is devoid of spiniform setae. Also, *A. potorous* has only a single row of large spiniform setae on the first pereonite, the other species have multiple rows.



Figure 10. *Acanthomunna potorous*. Holotype NMV J36986.

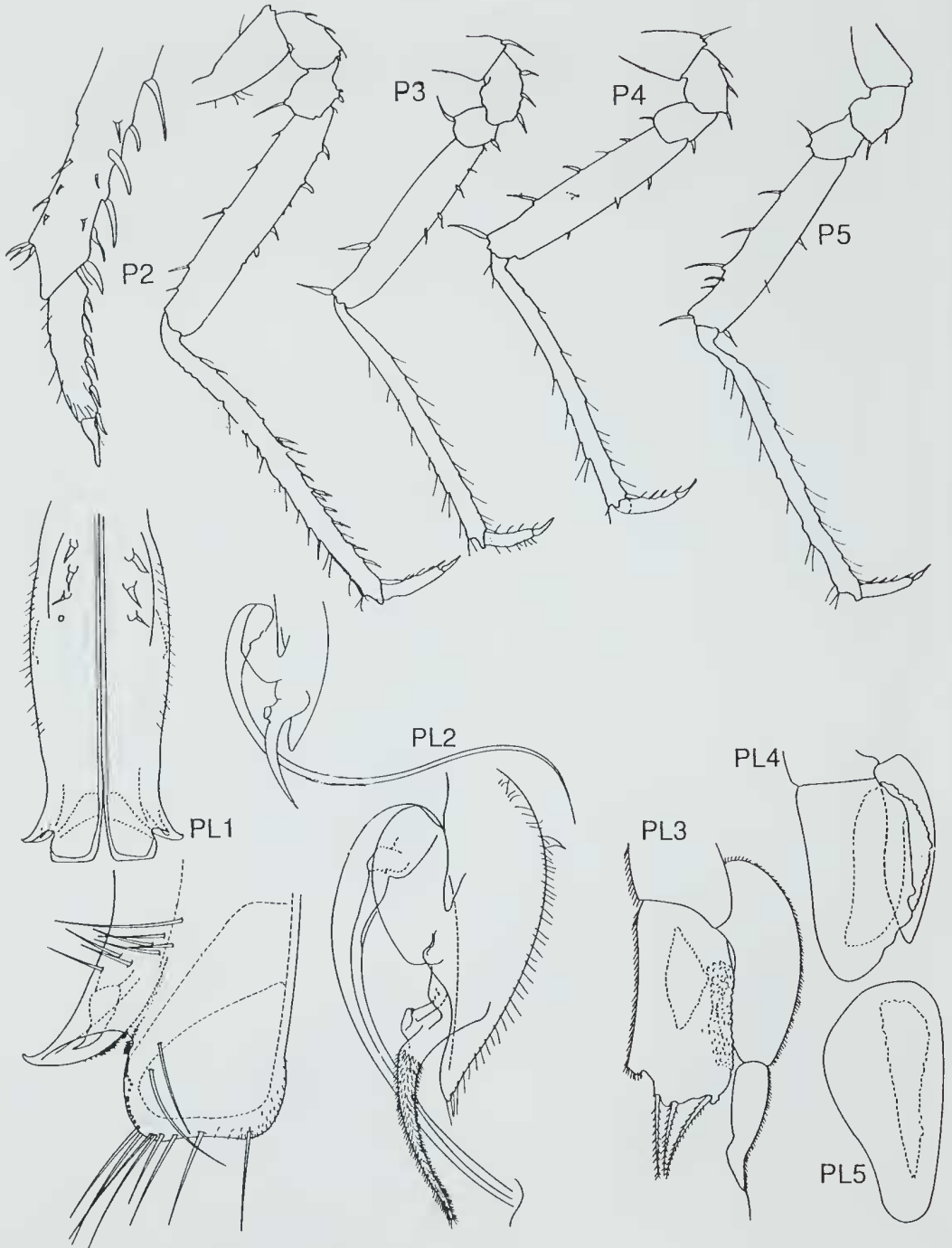


Figure 11. *Acanthomunna potorous*. Holotype NMV J36986; PL4-5 of paratype AM P52116.

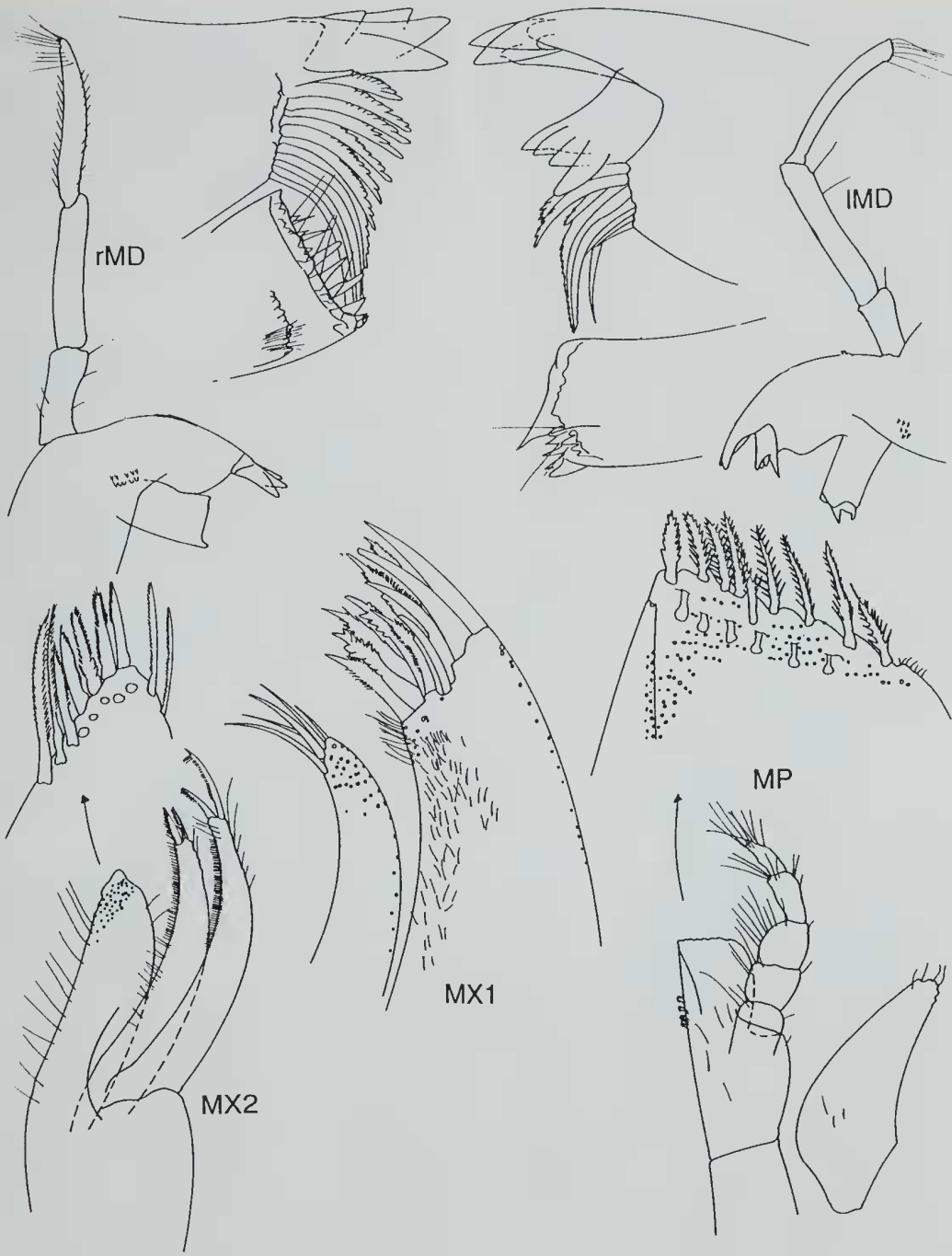


Figure 12. *Acanthomunna potorous*. Holotype NMV J36986.

Acanthomunna proteus Beddard

Figure 13

Acanthomunna proteus Beddard, 1886a: 103.—
Beddard, 1886b: 47–50, pl. 12 figs 7–14.

Material examined. Syntype. 37°34'S, 179°22'E, 700 fathoms (1281 m), blue mud, RV *Challenger*, 10 Jul 1874 (stn 169), BMNH 1889.4.27.56.

Description. Total length of syntype 4.11 mm. Cephalon subrectangular, twice as long as wide with small branched articulated spiniform setae and at least 2 long compound setae. Anterior margin of cephalon concave, produced between antennae. Pereon oval, widest at pereonites 3. Pereonites 1 to 4 broad; pereonite 5–7 compressed with concave lateral margins; lateral margins of pereonites 5–7 becoming successively more posteriorly projected; lateral margins of pereonite 7 partially hidden dorsally by pleotelson. Coxae with many simple and branched setae. Pereonite 1 with 2 large compound setae on mid-dorsal surface. Pereonites 1–4 with spiniform setae on 2 ridges; anterior ridge with larger spiniform setae and posterior ridge with smaller spiniform setae; pereonites 5–7 smooth dorsally,

devoid of setae. All pereonites with spiniform setae on lateral regions of pereonites. Most spiniform setae branched (see Fig. 13).

Pleonite 1 free, others fused to pleotelson. Pleotelson oval with posterior margin extending beyond uropods as a subrectangular projection. Pleotelson with many small spiniform setae covering all of the pleotelson in no discernible pattern; larger setae mostly branched; shallow inverted U-shaped sulcus middorsally; lateral margins with irregular appearance because of setal articulation joints.

Male pleopod 1 with acute distolateral lobe proximal to flat distal margin, bearing many long setae with another cluster of long setae at base of distolateral lobe; many simple and branched spiniform setae in proximal two-thirds of ventral surface. Male pleopod 2 proximal lobe knob shaped with distal fold, distal lobe elongate and heavily setose across a small band, in line with distal margin of peduncle only; appendix masculina (endopod) extremely long, extending well beyond peduncle and protruding beyond pleotelson. Pleopods 3–5 similar to *A. bettongia*. Uropods missing, thought large and inserted on dorsal surface of pleotelson.

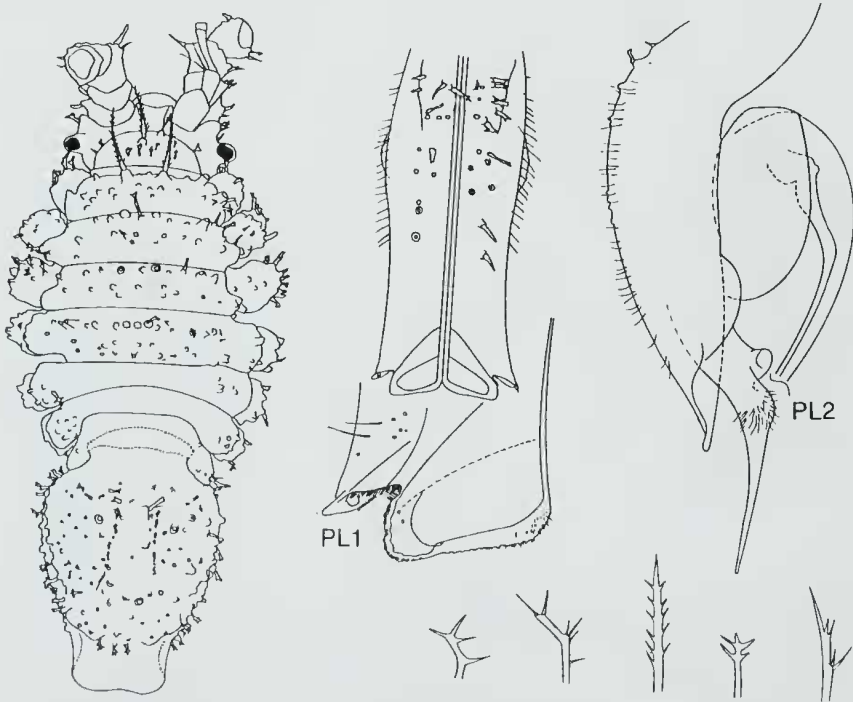


Figure 13. *Acanthomunna proteus*. Beddard, 1886. Syntype BMNH 1889.4.27.56.

Distribution. East of New Zealand, 1281 and 2011 m depth.

Remarks. Beddard's (1886b) description of *A. proteus* is outstanding even by modern taxonomic standards and should be referred to for further details. Unfortunately, the quality of the figures were not as high, therefore, the species has been refigured. *A. proteus* is easily recognisable as it is the only dendrotiid with branched spiniform setae.

Dendromunna Menzies

Dendromunna Menzies, 1962b: 167.—Wolff, 1962: 66.—Lincoln and Boxshall, 1983: 299.

Type species. *Dendromunna spinipes* Menzies, 1962b.

Diagnosis. Eyes absent. Antenna 1 basal article not elongate, at most twice as long as wide; peduncle articles 1–3 subequal. Pereonite 1 small, 2–4 large, 5–7 narrow. Pereonites 5–6 may

be extended laterally. Lateral regions of pereonites 2–5 bearing dorsolaterally directed projections ending in a cluster of spines. Similar projections and spine clusters may be found dorsally on pereonites 2–4. Pereopod 7 absent. Uropods large but variable; rami subequal, minute to massive; peduncle indistinct to large. Posterior pleotelson margin rounded between uropods.

Remarks. Only three species have been described to date. One specimen was collected from the SLOPE survey but was not described due to its poor condition. The three species described differ markedly in the relative proportions of the uropodal rami and peduncle. The uropodal peduncle of the type species, *D. spinipes* Menzies, 1962, is long, proportionally longer than in any other dendrotiid, while the rami are much reduced. The rami of the other two species of *Dendromunna* are large and stout but the peduncle of *D. compsa* Lincoln and Boxshall, 1983, is indistinct. The definition of this genus needs refinement and awaits the discovery of more intact species.

Key to species of *Dendromunna*

1. Pereonites 5–6 fused, pereonite 7 not distinguishable from pleotelson.....
.....*D. compsa* Lincoln and Boxshall, 1983
- Pereonites 5–7 not fused, pereonite 7 clearly distinguishable from pleotelson
.....2
2. Uropodal rami much shorter than peduncle.....*D. spinipes* Menzies, 1962
- Uropodal rami long, endopod 4 times as long as peduncle.....
.....*D. mirabile* Wolff, 1962

Dendrotion Sars

Dendrotion Sars, 1872: 30.—Sars, 1897: 116.—Hansen, 1916: 50.—Wolff, 1962: 65.—Lincoln and Boxshall, 1983: 304.

Type species. *Dendrotion spinosum* Sars, 1872.

Diagnosis. Eyes absent. Cephalon with pair of anterior dorsal processes supporting antennae. Antennae long and slender. Antenna 1 basal article long, more than 5 times longer than wide; second article short, third article as long as first. Antenna 2 marginally longer than antenna 1; peduncle articles 1–3 short, articles 4 and 5 extremely long and slender. Pereon cylindrical anteriorly, slender posteriorly. Pereonites 1–4 large and barrel shaped, length increasing posteriorly, with rounded lateral extensions; pereonites 5–7 narrow with pronounced lateral extensions becoming successively more posteriorly directed. Pereonites with spine-like projections laterally, often long, which appear to be derived from the coxal region on pereonites 5–7. Pereon devoid of

spines dorsally though often adorned with long and conspicuous setae. All pleonites fused to pleotelson. Lateral margins of pleotelson adorned with a row of articulated spiniform setae, setae decreasing in length posteriorly; posterior margin protruding beyond posteriorlateral bosses which support uropods. Mouthparts typical of Asellota. Left mandible not stronger than right. Maxilliped palp much narrower than endite, of 5 articles; epipod broad and flat, distally tapered. Pereopod 1 prehensile, reflexed between carpus and propodus, shorter than other pereopods; carpus and propodus with stout setae along posterior margin. Pereopods 2–7 ambulatory; long and slender, becoming successively more elongate; basis, ischium and merus not compact as in *Acanthomunna*; carpus and propodus elongate. Pereopod 7 present in all but one species. Male pleopod 1 subrectangular. Male pleopod 2 peduncle tapered; exopod bilobed. Pleopods 4–5 similar to *A. betongia*. Uropods large and robust, inserted posterolaterally on dorsal surface of pleotelson; peduncle elongate; endopod reduced; exopod

variable ranging from same to many times size of endopod.

Remarks. The four newly described species of *Dendrotion* are the first to be recorded from the Southern Hemisphere or outside the North Atlantic Ocean. Species of *Dendrotion* vary little in body morphology or proportions though

ovigerous females become dorsoventrally flattened (Lincoln and Boxshall, 1983). All dendrotionids possess large and robust uropodal peduncles and insertion sockets on pleotelson. The number and location of dorsal setae and the size and shape of the lateral extensions off the pereonites (particularly pereonites 5–7) are the main characteristics used to separate species.

Key to species of *Dendrotion*

1. Pereonite 7 lacking lateral extension which supports pereopods, pereopod 7 absent; uropodal rami subequal, endopod only marginally longer than exopod.....*D. peradorcus* sp. nov.
- Pereonite 7 with lateral extension supporting pereopods, pereopod 7 present; uropodal endopod much larger than exopod.....2
2. Pereon and pleotelson devoid of dorsal setae.....*D. spinosum* Sars, 1872
- Pereon and pleotelson with at least a few dorsal setae.....3
3. Lateral projection off pereonites spinose and granular.....
-*D. paradoxum* Hansen, 1916
- Lateral projection off pereonites smooth.....4
4. Pereonites 5–7 lacking dorsal setae.....5
- Pereonites 5–7 with dorsal setae.....6
5. Pereonites 1, 3 and 4 lacking dorsal setae.....*D. onychogalea* sp. nov.
- Pereonites 1, 3 and 4 with many dorsal setae.....
-*D. setosum* Lincoln and Boxshall, 1983
6. Pereonites 1–2 devoid of setae.....*D. hansenii* Menzies, 1956
- Pereonites 1–2 with setae.....7
7. Pereonite 7 with 4 dorsal setae.....*D. thylogale* sp. nov.
- Pereonite 7 with 2 dorsal setae.....8
8. Pereonite 4 devoid of setae.....*D. petrogale* sp. nov.
- Pereonite 4 with anterior and posterior dorsal setae.....
-*D. elegans* Lincoln and Boxshall, 1983

Dendrotion onychogalea sp. nov.

Figures 14–16

Material examined. Holotype. Victoria, S of Point Hicks (38°17.70'S, 149°11.30'E), 400 m, coarse sand, gravel, mud with many sponges, WHOI epibenthic sled, M.F. Gomon et al. on RV *Franklin*, 24 Jul 1986 (stn SLOPE 40), NMV J36967 (female).

Paratypes. Type locality, NMV J36969 (1 male), NMV J37000 (1 female); S of Point Hicks (38°14.80'S, 149°9.30'E), 200 m, coarse sand and gravel, WHOI epibenthic sled, M.F. Gomon et al. on RV *Franklin*, 24 Jul 1986 (stn SLOPE 41), NMV J36968 (1 female).

Other material. Type locality, NMV J18545 (35 specimens); S of Point Hicks (38°14.80'S, 149°9.30'E), 200 m, coarse sand and gravel, WHOI epibenthic sled, M.F. Gomon et al. on RV *Franklin*, 24 Jul 1986 (stn SLOPE 41), NMV J18546 (10 specimens).

Description. Total length of holotype 2.39 mm. Cephalon subrectangular dorsally with anterolateral dorsal processes supporting antennae; twice as long as wide. Anterior margin of cephalon between processes straight. Antenna 1 flagellum

with 11 articles with 3 aesthetascs located on 2 most distal articles. Antenna 2 flagellum with 9 articles of decreasing length.

Pereonites 1–4 with small projections on lateral margins which support long setae, most pronounced on pereonites 1 and 2; pereonite 2 with a pair of middorsal setae; other pereonites lacking dorsal setae. Posterior margin of pereonite 4 convex, overhanging pereonite 5; pereonite 5 with long, slender lateral extension with terminal spine-like spiniform setae which appear to be derived from the coxa. Coxae visible dorsally, some with small projections; lateral margins of pereonite 7 directed posteroventrally, hidden dorsally by pleotelson.

Pleotelson elliptical, 1.2 times longer than wide; a shallow sulcus along dorsolateral and posterior margins; 4–5 spiniform setae clumped anteriorlaterally, 5 spiniform setae along lateral margins and 8 simple setae along rounded posterior margin; some spiniform setae with bifid distal end and thread-like projection.

Left mandibular incisor process 4-dentate, lacinia mobilis 3-dentate; right mandibular incisor process 5-dentate. Left mandibular spine row with 3 spines, 2 armed; right mandibular spine row with 4 spines, 3 armed. Left mandibular molar sharply angled, with 5 long setae. Right mandibular molar crenulate, with 4 long simple setae. Mandibular palp absent. Maxilla 1 outer lobe with 10 stout spines visible, 3 denticulate; inner lobe with 1 long setae only. Maxilla 2 with stout setae on all lobes; outer lobe with 4 spiniform setae; middle lobe with 3 denticulate setae and inner lobe with 5 denticulate setae. Maxilliped with 2 coupling hooks; endite distal margin with 9 denticulate setae.

Pereopods typical, distal anterior margin of carpus on pereopod 6 bearing a long compound setae.

Male pleopod 1 with acute distolateral lobe proximal to straight distal margin bearing many long setae; 9–12 long setae proximal to distolateral lobe and oblique groove on distolateral margin. Male pleopod 2 proximal lobe large with linear distal margin; distal lobe elongate and setose, extending beyond peduncle and appendix masculina; appendix masculina (endopod) extending just beyond peduncle. Pleopod 3 endopod reaching to distal margin of second article of exopod, with 3 long compound setae distally; exopod with 1 short setae distally. Pleopods 4–5 similar to *A. bettongia*, with concaved depression centrally. Uropodal endopod reduced, one-fifth length of exopod; peduncle obvious, shorter than exopod.

Distribution. Tasman Sea off Point Hicks, Victoria, 200–400 m depth.

Remarks. *Dendrotion onychogalea* is remarkable for the shape of its pleotelson which is subcircular. All other described species of *Dendrotion* possess a more elongate pleotelson with a distinctive neck region anteriorly and tapered posterior margins. This pleotelson gives *D. onychogalea* a more compact and stout habitus than other species.

Dendrotion peradorcus sp. nov.

Figures 17–19

Material examined. Holotype. Victoria. S of Point Hicks (38°25'S, 149°0'E), 1500 m, compacted clay, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 22 Jul 1986 (stn SLOPE 27), NMV J36970.

Paratypes. Type locality, NMV J36972 (1 female), 76 km S of Point Hicks (38°29.33'S, 149°19.98'E), 1840 m, sandy mud with fine shell, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 26 Oct 1988

(stn SLOPE 69), NMV J36971 (1 male), NMV J36999 (1 female).

Other material. Tasmania. Off Freycinet Peninsula (42°2.20'S, 148°38.70'E), 800 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al. on RV *Franklin*, 27 Jul 1986 (stn SLOPE 45), NMV J18548 (1 specimen); 42°0.20'S, 148°37.70'E, 720 m, coarse shelly sand (stn SLOPE 46), NMV J18549 (1 specimen); 41°58.60'S, 148°38.80'E, 500 m, coarse shell (stn SLOPE 47), NMV J18550 (1 specimen); 48 km ENE of Cape Tourville (42°0.25'S, 148°43.55'E), 1264 m, gravel with lumps of sandy mud aggregate, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 30 Oct 1988 (stn SLOPE 81), NMV J18553 (6 specimens), NMV J18554 (6 specimens).

Victoria. Type locality, NMV J18547 (3 specimens). S of Point Hicks (38°40.29'S, 149°18.06'E), 2900 m, compacted clay, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 25 Oct 1988 (stn SLOPE 66), NMV J18551 (1 specimen); 38°29.33'S, 149°19.98'E, 1840 m, sandy mud with fine shell, 26 Oct 1988 (stn SLOPE 69), NMV J18552 (14 specimens); 38°23.95'S, 149°17.02'E, 1277 m, fine mud, 25 Oct 1988 (stn SLOPE 67), NMV J18557 (1 specimen).

Description. Total length of holotype 2.76 mm. Cephalon quadrate dorsally with anterolateral dorsal processes supporting antennae; as long as wide. Anterior margin of cephalon between processes slightly concave. Antenna 1 flagellum with 11 articles with only 1 aesthetasc located on most distal article. Antenna 2 flagellum with at least 5 articles, first article long and slender.

Pereon with pronounced lateral extensions of pereonites 5 and 6 only, directed posteriorly on pereonite 6. Pereonites 1–4 with small projections on lateral margins which support long setae, most pronounced on pereonites 1 and 2. Pereonite 1 with middorsal ridge running between rounded lateral extensions; pereonites 2–3 with a pair of long middorsal setae; pereonite 4 long, tapered posteriorly. Pereonites 5–6 with long spine-like extension which supports large, curved spiniform setae and appears to be derived from the coxal region; spiniform setae posteriorly directed on pereonite 5 and anteriorly directed on pereonite 6. Pereonite 7 with no lateral extensions.

Pleotelson elliptical posteriorly, 1.4 times longer than wide with a distinct anterior neck. A shallow sulcus running posteriorly to posteriorlateral bosses; ventral lateral margins with a row of 7–9 bifid rounded spiniform setae, setae similar to setae of *D. onychogalea*, decreasing in size posteriorly; distal margin tapered, with numerous long setae.

Left mandibular incisor process 4-dentate, lacinia mobilis 5–7-dentate; right mandibular incisor process 4-dentate. Left mandibular spine



Figure 14. *Dendrotion onychogalea*. Holotype NMV J36967; A1 and A2 of paratype NMV J37000; Lateral view of paratype NMV J36968.

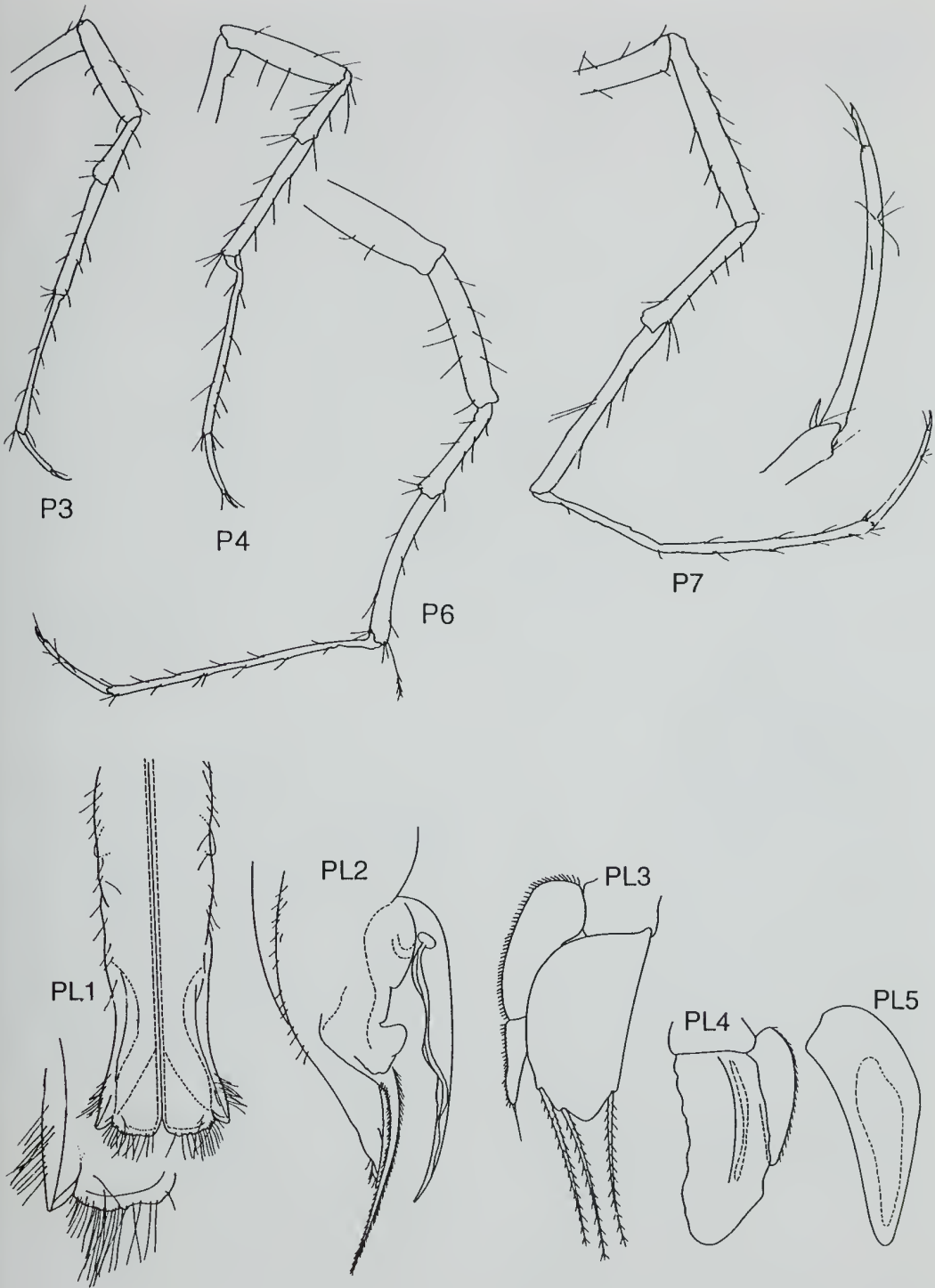


Figure 15. *Dendrotion onychogalea*. Holotype NMV J36967; P3-4 and PL1-2 of paratype NMV J36969; P6 and PL3-5 of paratype NMV J36968.

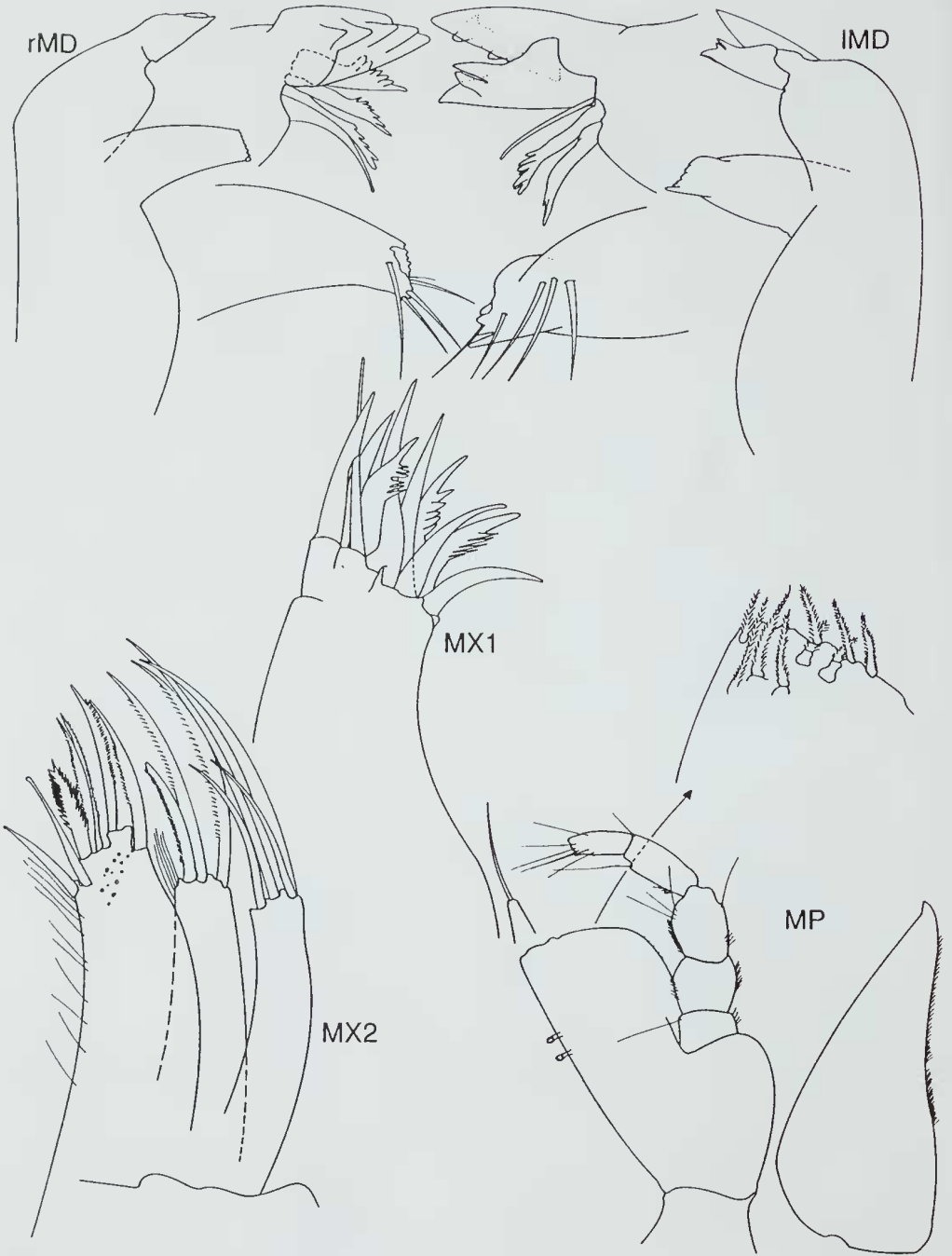


Figure 16. *Dendrotion onychogalea*. Holotype NMV J36967.

row absent; right mandibular spine row with 3 armed spines. Left mandibular molar sharply angled, with 11 compound setae. Right mandibular molar complex, with long simple setae and short, rounded spiniform setae. Mandibular palp absent. Maxilla 1 outer lobe with 10 stout spines visible, only 1 denticulate; inner lobe with 1 long setae only. Maxilla 2 with stout setae on all lobes; outer lobe with 3 long setae; middle lobe with 2 long setae and inner lobe with 7 setae, 2 denticulate. Maxilliped with 1 coupling hook; endite distal margin with 5 large setae.

Pereopods typical except pereopod 7 absent in adults.

Male pleopod 1 with rounded distal margin bearing 13–14 long setae each side distal to oblique groove and many long setae along lateral margins. Male pleopod 2 proximal lobe rounded and distal lobe short and setose; appendix masculina (endopod) short, extending just beyond peduncle. Pleopod 3 endopod just reaching second article of exopod, with 3 long compound setae distally; exopod with 1 short setae distally. Pleopods 4–5 similar to *A. bettongia*. Uropod exopod reduced, as long as endopod; peduncle 3 times as large as rami.

Distribution. Tasman Sea off Victoria and Tasmania, 500–2900 m depth.

Remarks. *Dendrotion peradorcus* is a remarkable species. It is the only species of *Dendrotion* to retain the neotenous characteristic of six pairs of pereopods into adulthood. Pereopod 7 is absent as in *Dendromunna*. Pereonite 7 also lacks lateral extensions on which the pereopods are supported in other *Dendrotion* species. Also, both rami of the uropods are similar in size. In all other species of *Dendrotion* which have been collected with intact uropods, the exopods are greatly enlarged, compared to the endopods. *D. peradorcus* is most easily recognised by the unique pereonite 7, the large extensions of pereonites 5 and 6 and subequal uropodal rami.

Dendrotion petrogale sp. nov.

Figures 20–22

Material examined. Holotype. Victoria. 67 km S of Point Hicks (38°23.95'S, 149°17.02'E), 1277 m, fine mud, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 25 Oct 1988 (stn SLOPE 67), NMV J36965 (male).

Paratypes. Type locality, NMV J37003 (1 male), NMV J37004 (1 female), NMV J37005 (1 specimen).

New South Wales. 54 km ESE of Nowra (34°52.72'S, 151°15.04'E), 996 m, mud, fine sand, fine shell, WHOI

epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 22 Oct 1988 (stn SLOPE 53), NMV J18555 (1 specimen). E of Broken Bay, 33°40'S, 152°06'E, 1116 m, trawl, FRV *Kapala*, 19 Dec 1985, stn K85-21-05, AM P52117 (3).

Other material. Victoria. Type locality, NMV J18556 (10 specimens).

Description. Total length of holotype 2.21 mm. Cephalon quadrate dorsally with anterolateral dorsal processes supporting antennae; as long as wide. Anterior margin of cephalon between processes convex. Antenna 1 flagellum with 14 articles with 3 aesthetascs located on distal article. Antenna 2 flagellum lost.

Pereonites 1–3 with small projections off lateral margins which support long setae, most pronounced on pereonites 1 and 2. Pereonite 1 with middorsal ridge running between rounded lateral extensions; pereonites 2 and 3 with 2 pairs of long middorsal setae further towards lateral margins on pereonite 3; pereonite 4 long, devoid of middorsal setae, lateral margins with short spiniform setae anteriorly and tapered posteriorly. Pereonites 5–7 with long setae located on lateral extensions on pereonites 5 and 6 and middorsally on pereonite 7. Coxal regions visible on pereonites 3–7; supporting long setae on pereonites 5–7.

All pleonites fused to pleotelson. Pleotelson elliptical posteriorly, longer than wide with a anterior neck. A shallow inverted U-shaped sulcus located middorsally; ventral lateral margins with a row of 3–6 tapered spiniform setae; distal margin rounded, with numerous long setae.

Left mandibular incisor process 2-dentate, lacinia mobilis 3-dentate; right mandibular incisor process 5-dentate. Left mandibular spine row with 4 spines; right mandibular spine row with 4 armed spines. Left mandibular molar flat, with 8 simple setae. Right mandibular molar crenulate with 8 long simple setae. Mandibular palp absent. Maxilla 1 outer lobe with 10 stout spines visible, 3 denticulate; inner lobe with 1 long setae only. Maxilla 2 with stout setae on all lobes; outer lobe with 2 spiniform setae; middle lobe with 3 spiniform setae, 2 denticulate; inner lobe with 4 spiniform setae, 2 denticulate. Maxilliped with 2 coupling hook; endite distal margin with 7 spiniform setae.

Pereopod 1 lost; pereopods 2–7 typical, all pereopods heavily setose.

Male pleopod 1 with rounded distal margin bearing 7–8 long setae each side and 7 long setae along lateral margins. Male pleopod 2 proximal lobe rounded and distal lobe short and setose; appendix masculina (endopod) short, extending

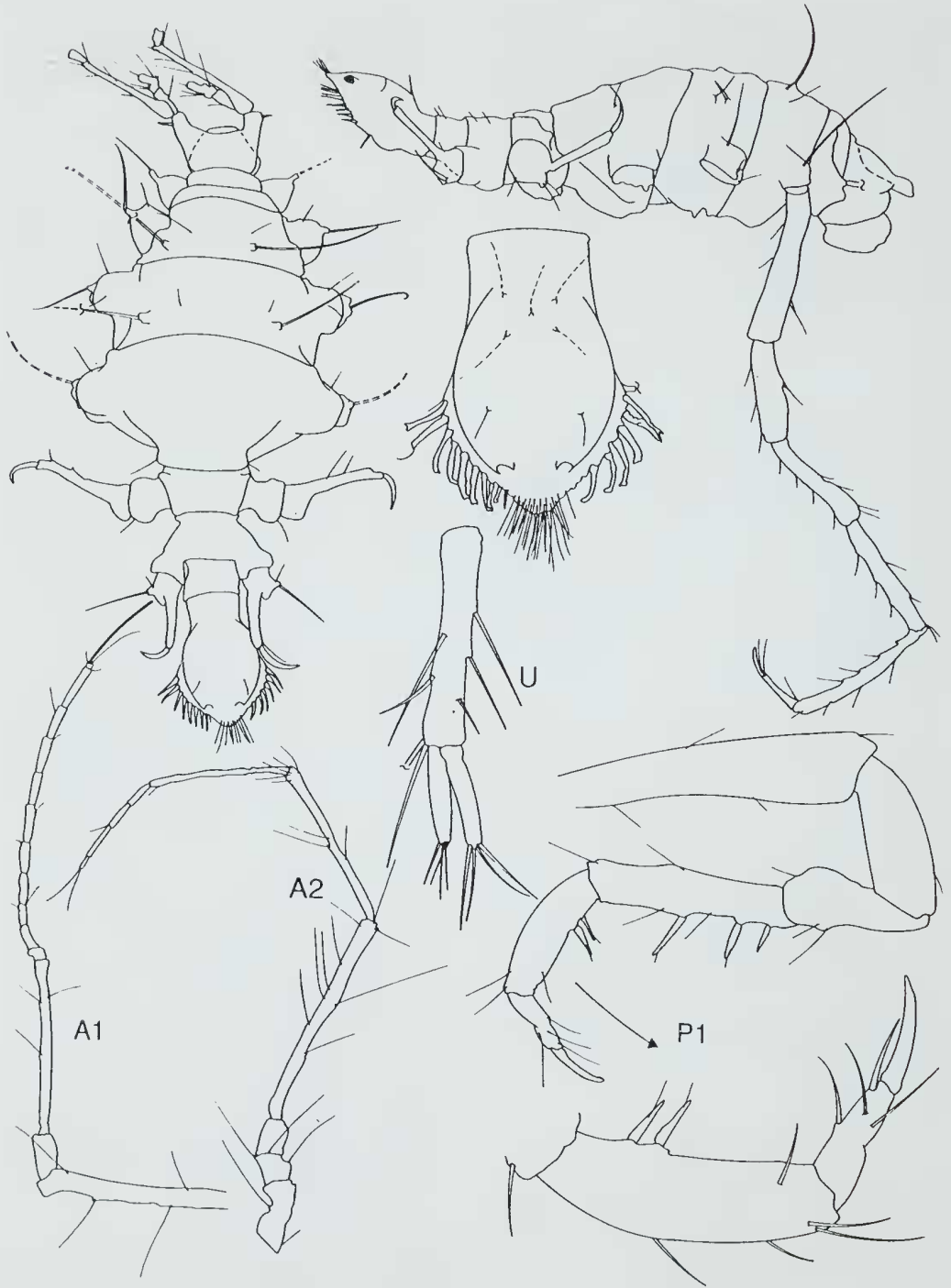


Figure 17. *Dendrotion peradorcus*. Holotype NMV J36980; A1, A2 and U of paratype NMV J36972; P1 of paratype NMV J36999.

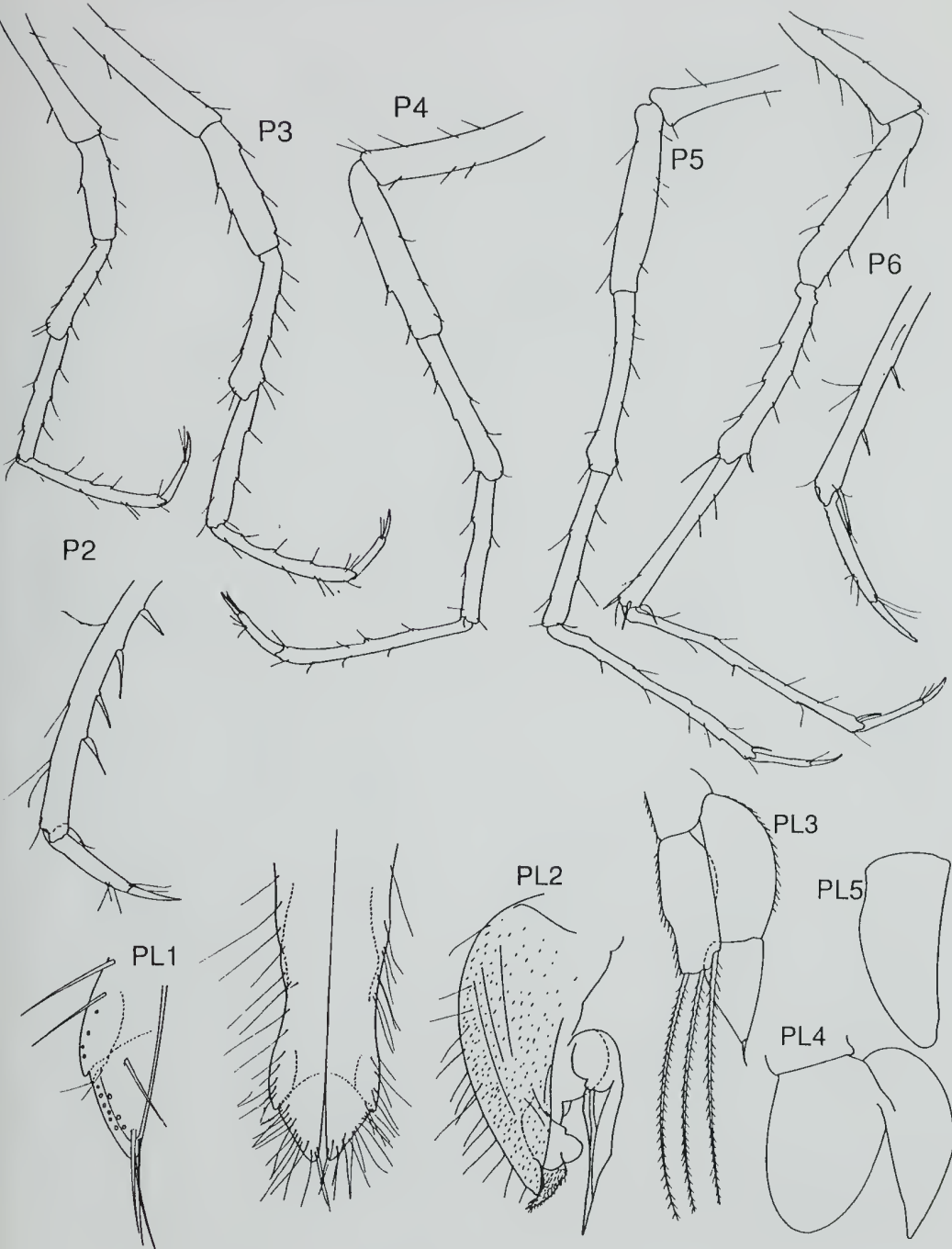


Figure 18. *Dendrotion peradorcus*. P2-7 of paratype NMV J36999; PL1-5 of paratype 36971.

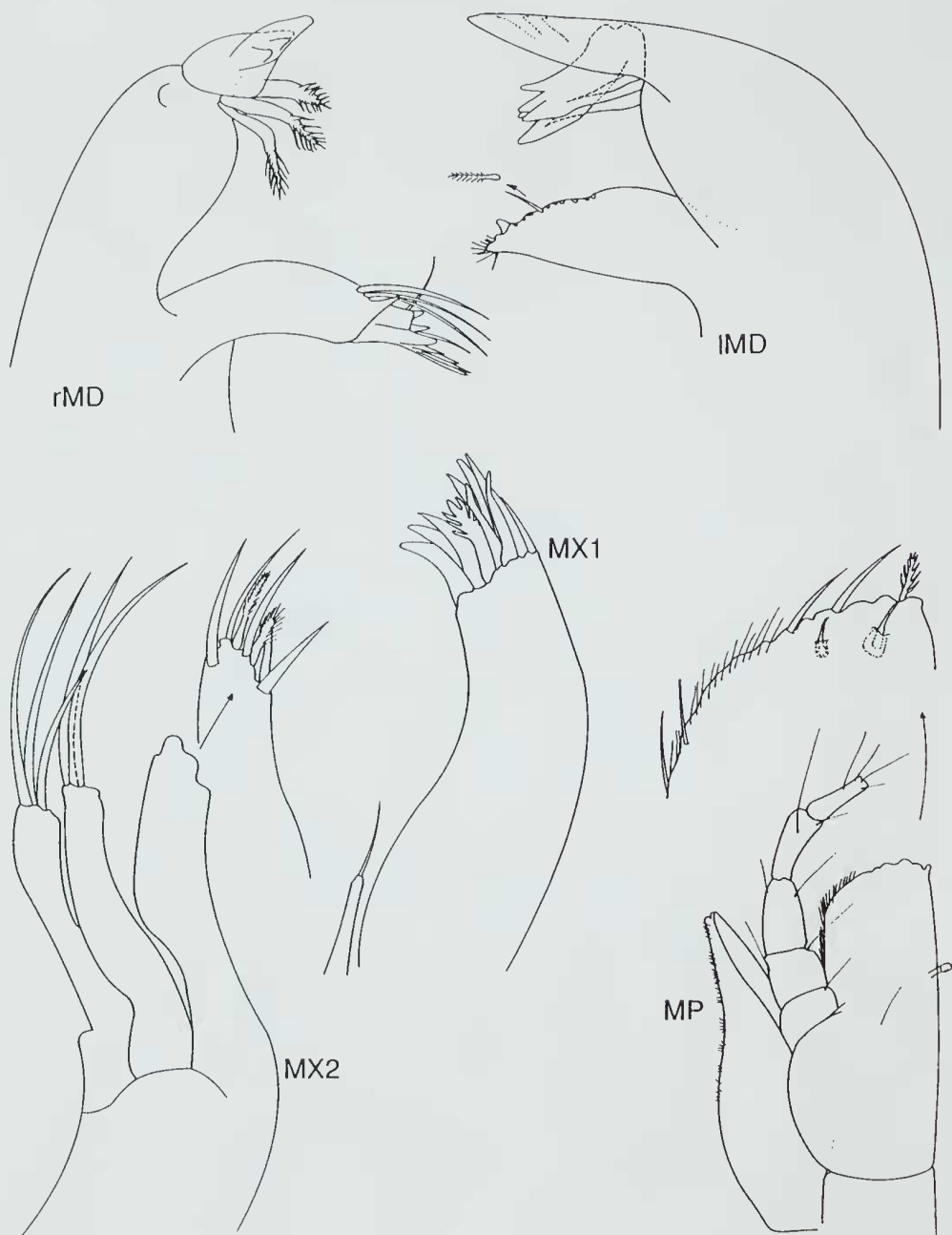
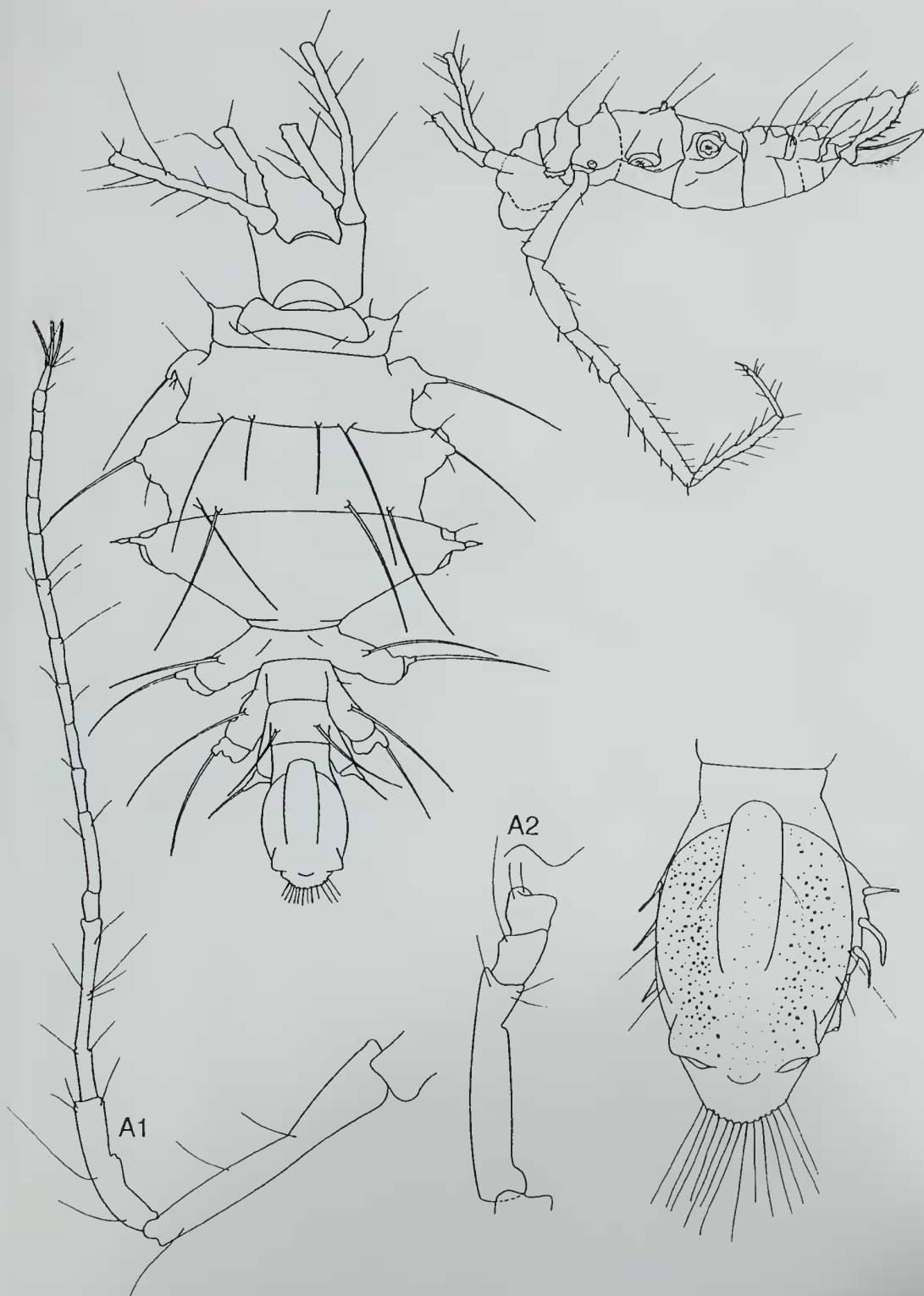


Figure 19. *Dendrotion peradorcus*. Paratype NMV J36972.



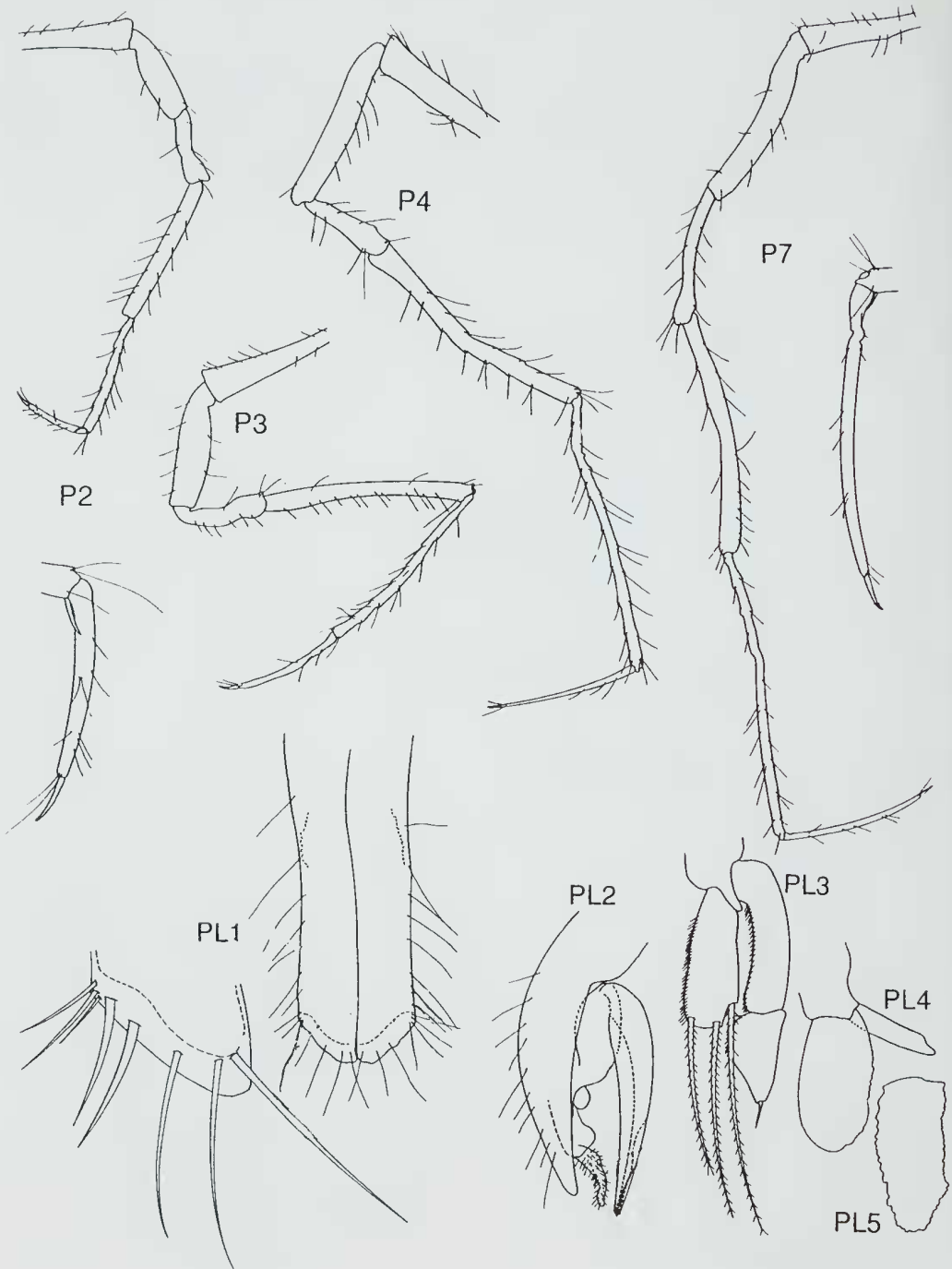


Figure 21. *Dendrotion petrogale*. PL1-5 of paratype NMV J37003; P2-7 of paratype NMV J18555.

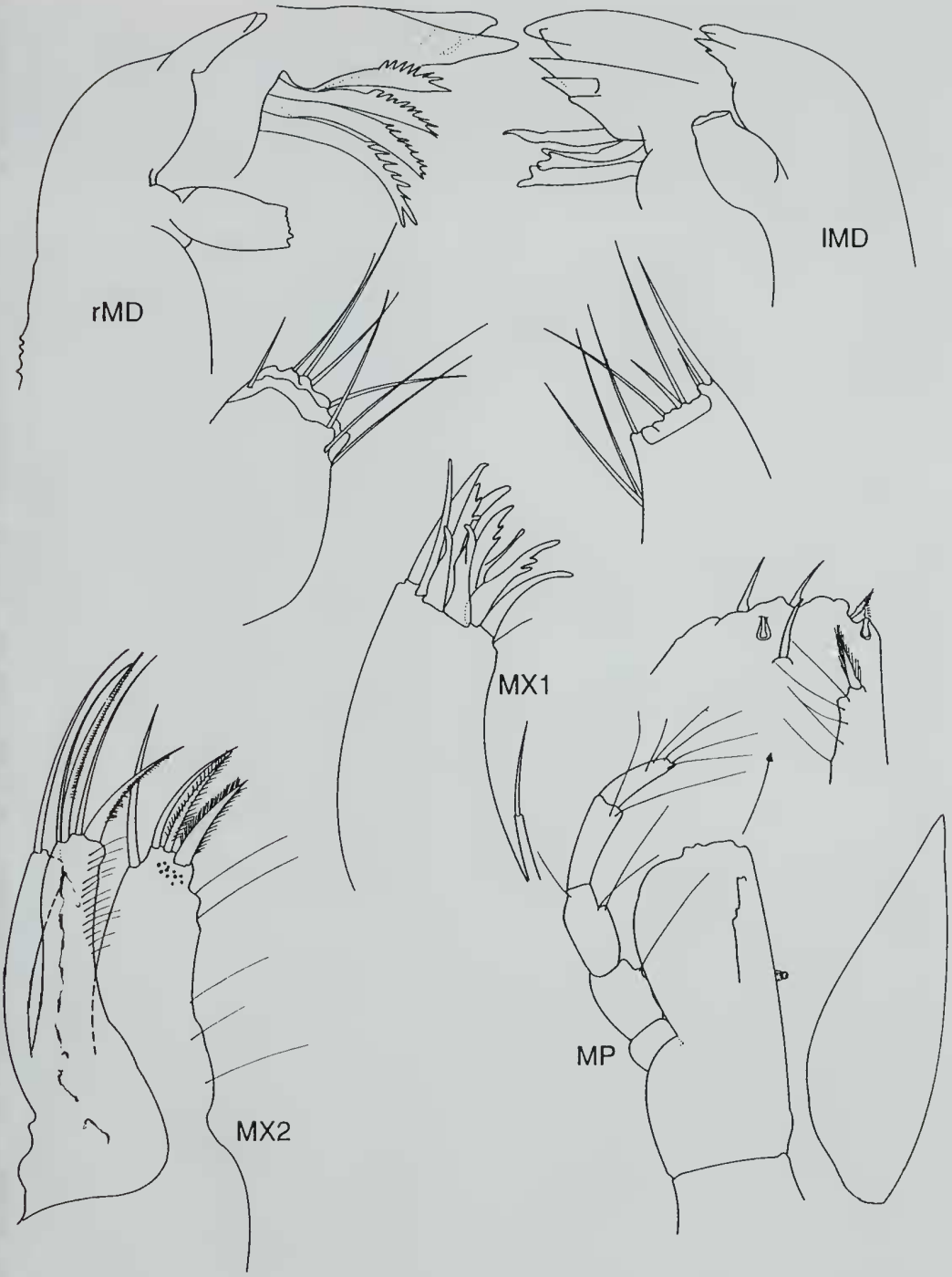


Figure 22. *Dendrotion petrogale*. MX1, MX2 and MP of paratype NMV J37004; LMD and RMD of paratype NMV J37005.

just beyond peduncle. Pleopod 3 endopod just reaching second article of exopod, with 3 long compound setae distally; exopod with 1 short setae distally. Pleopods 4–5 similar to *A. bettongia*; pleopod 5 lateral and distal margins crenulate. Uropods lost, thought large and inserted laterally on dorsal surface of pleotelson.

Distribution. Tasman Sea off NSW and Victoria, 996 and 1277 m depth.

Remarks. *Dendrotion petrogale* is easily distinguishable from the other known members of this genus. *D. petrogale* possess unique, small spiniform setae on the lateral margins of pereonite 4 with no other similar projections on any other pereonites.

Dendrotion thylogale sp. nov.

Figures 23–25

Material examined. Holotype, Tasmania, 48 km ENE of Cape Tourville (42°00.25'S, 148°43.55'E), 1264 m, gravel with lumps of sandy mud aggregate, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 30 Oct 1988 (stn SLOPE 81), NMV J37001 (female).

Paratypes. Type locality, NMV J36973 (1 male), Eastern Bass Strait, 87 km ENE of North Point, Flinders I. (39°28.2'S, 148°52.4'E), 841 m, muddy sand, naturalists' dredge, G.C.B. Poore on HMAS *Kimbla*, 29 Mar 1979 (stn BSS 37), NMV J36974 (1 specimen).

Victoria, 76 km S of Point Hicks (38°29.33'S, 149°19.98'E), 1840 m, sandy mud with fine shell, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 26 Oct 1988 (stn SLOPE 69), NMV J36975 (1 specimen), NMV J37002 (1 specimen).

Other material. Tasmania. Off Freycinet Pen-insula (42°2.20'S, 148°38.70'E), 800 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al. on RV *Franklin*, 27 Jul 1986 (stn SLOPE 45), NMV J18560 (2 specimens); 42°0.20'S, 148°37.70'E, 720 m, coarse shelly sand (stn SLOPE 46), NMV J18561 (3 specimens); 48 km ENE of Cape Tourville (42°00.25'S, 148°43.55'E), 1264 m, gravel with lumps of sandy mud aggregate, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 30 Oct 1988 (stn SLOPE 81), NMV J18565 (8 specimens). Eastern Bass Strait, 87 km ENE of North Point, Flinders I. (39°28.2'S, 148°52.4'E), 841 m, muddy sand, naturalists' dredge, G.C.B. Poore on HMAS *Kimbla*, 29 Mar 1979 (stn BSS 37), NMV J18566 (4 specimens).

Victoria, S of Point Hicks (38°21.90'S, 149°20.00'E), 1000 m, WHOI epibenthic sled, G.C.B. Poore et al. on RV *Franklin*, 23 Jul 1986 (stn SLOPE 32), NMV J18559 (2 specimens); 38°23.95'S, 149°17.02'E, 1277 m, fine mud, 25 Oct 1988 (stn SLOPE 67), NMV J18563 (1 specimen); 38°29.33'S, 149°19.98'E, 1840 m, sandy mud, fine shell, WHOI epibenthic sled,

G.C.B. Poore et al. on RV *Franklin*, 26 Oct 1988 (stn SLOPE 69), NMV J18564 (1 specimen).

New South Wales. Off Nowra (34°52.29'S, 151°15.02'E), 1096 m, shell, WHOI epibenthic sled, G.C.B. Poore and C.C. Lu on RV *Franklin*, 15 Jul 1986 (stn SLOPE 7), NMV J18558 (1 specimen); 34°52.72'S, 151°15.04'E, 996 m, mud, fine sand and fine shell, G.C.B. Poore et al., 22 Oct 1988 (stn SLOPE 53), NMV J18562 (1 specimen).

Description. Total length of holotype 2.79 mm. Cephalon quadrate dorsally with anterolateral dorsal processes supporting antennae; as long as wide. Anterior margin of cephalon between processes straight. Antenna 1 flagellum with 10–11 articles with 3 aesthetascs located on 2 most distal articles. Antenna 2 flagellum lost.

All pereonites with long slender protrusions off lateral extensions, derived from pereon on pereonites 1–4 and from the coxae on pereonites 5–7. Pereonites 2–3 with 3 pairs of long setae on posterior dorsal margins; pereonites 4 and 7 with 2 pairs of long setae on posterior dorsal margin. Pereonite 4 long, lateral margins tapered posteriorly; pereonites 5–6 with pair of long setae on lateral extensions of the pereonites. Coxal regions visible dorsally on pereonites 2–7; supporting setae on pereonites 3–7.

Pleotelson elliptical posteriorly, 1.5 times longer than wide; with anterior neck; surface pitted and granular. A shallow semicircular shaped sulcus located laterally of middorsal line; ventral lateral margins with only 2 tapered spiniform setae; distal margin rounded and crenulated, with numerous long setae.

Left mandibular incisor process appears damaged, lacinia mobilis 3-dentate; right mandibular incisor process 6-dentate. Left mandibular spine row with 2 spines; right mandibular spine row with 4 armed spines. Left mandibular molar tapered, with 8 simple setae and 3 large setae. Right mandibular molar crenulate with 6 long simple setae and 7 tapered spiniform setae. Mandibular palp absent, single setae in position of mandibular palp. Maxilla 1 outer lobe with 11 stout spines, 3 denticulate; inner lobe with 1 long setae and many small setae. Maxilla 2 with stout spiniform setae on all lobes; outer lobe and middle lobes with 3 setae; inner lobe with 6 setae, 2 denticulate. Maxilliped with no coupling hook; endite distal margin with 8 spiniform setae.

Pereopods typical.

Male pleopod 1 with acute distolateral lobe proximal to flat distal margin bearing many long setae; distolateral lobe bearing 5 setae and ventral margins with about 20 setae. Male pleopod 2 proximal lobe folded, distal lobe short and

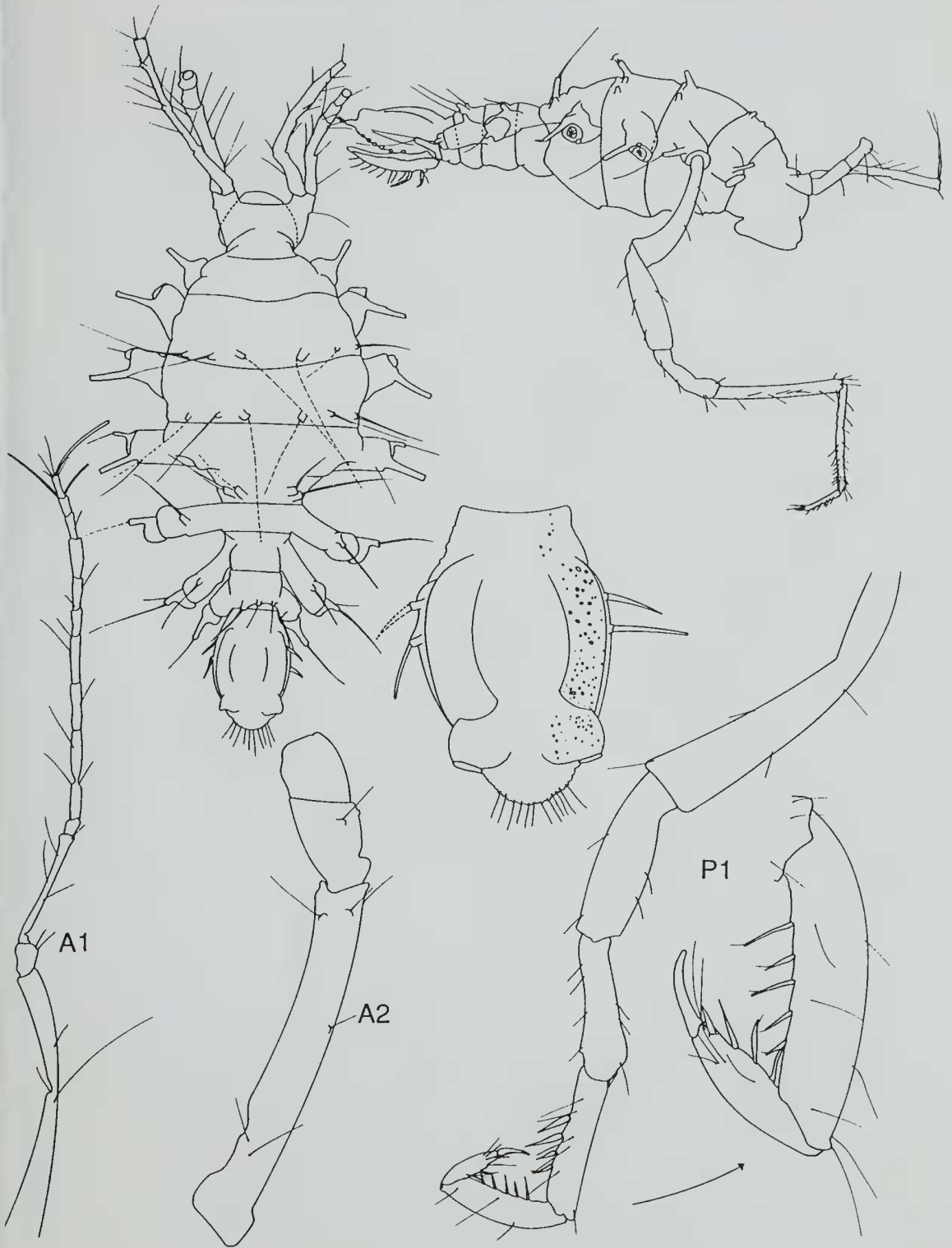


Figure 23. *Dendrotion thylogale*. Holotype NMV J37001; A1 and A2 of paratype NMV J36974; P1 of paratype NMV J36975.

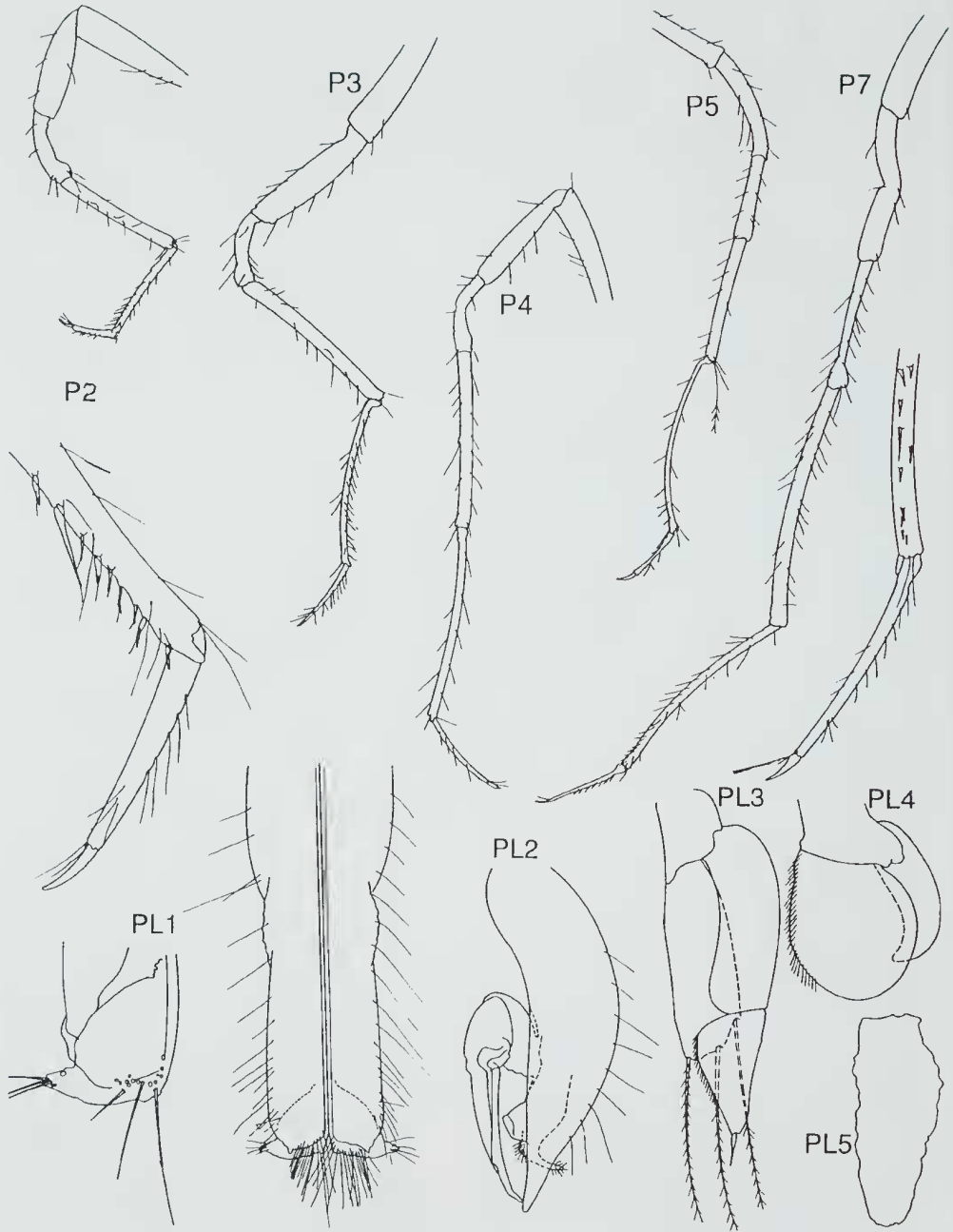


Figure 24. *Dendrotion thylogate*. PL1-5 of paratype NMV J36973; P2-7 of paratype NMV J3695.

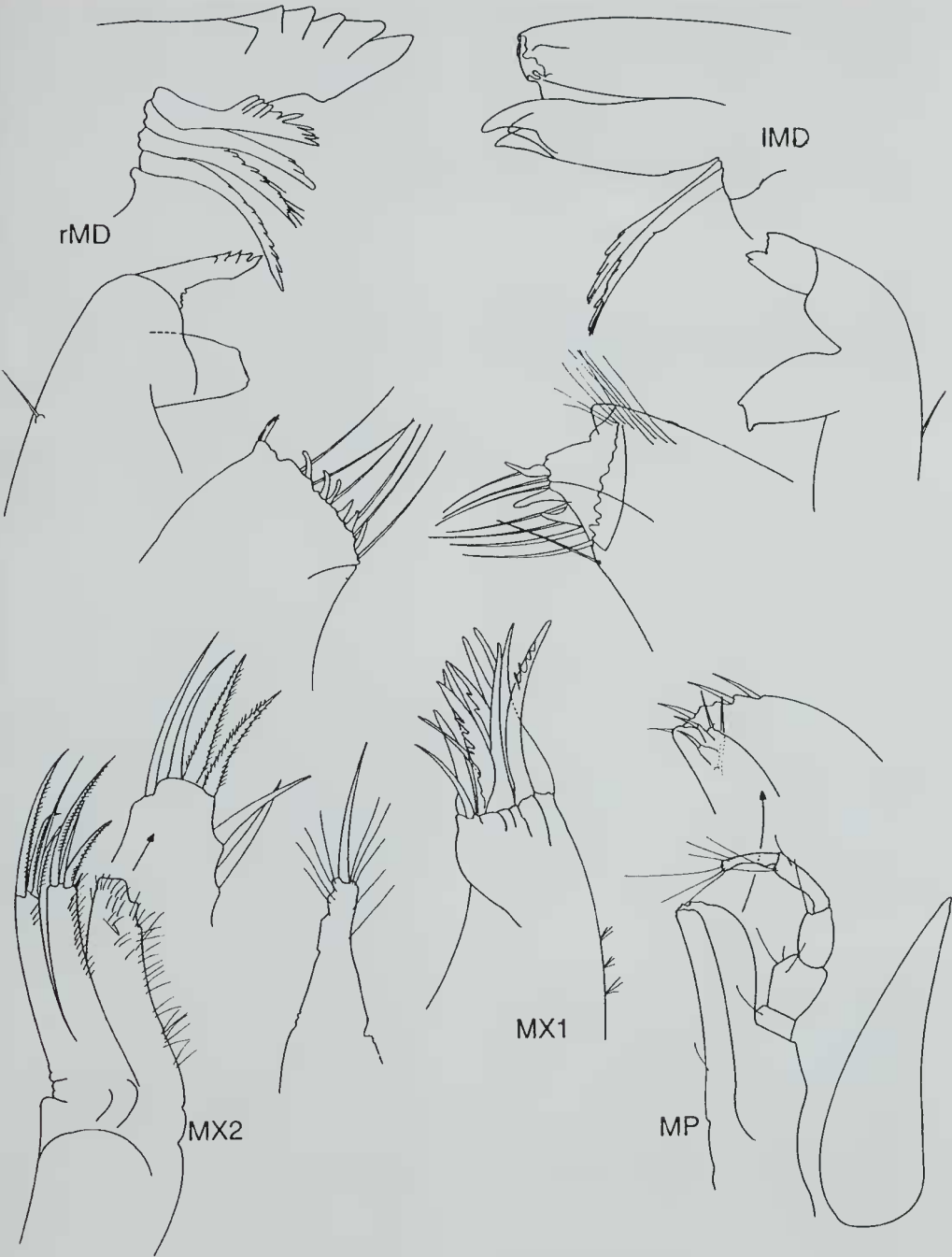


Figure 25. *Dendrothion thylogale*. Paratype NMV J37002.

setose; appendix masculina (endopod) short, not extending beyond peduncle. Pleopod 3 endopod reaching second article of exopod, with 3 long compound setae distally; exopod with 1 short setae distally. Pleopods 4–5 similar to *A. bettongia*; pleopod 5 margin crenulate. Uropods lost, thought clearly large and inserted laterally on dorsal surface of pleotelson.

Distribution. Tasman Sea from NSW to Victoria, 720–1840 m depth.

Remarks. *Dendrotion petrogale* is distinguishable from other species of *Dendrotion* by the unique pattern of dorsal spination of the pereon and the reduced setae pattern on the lateral margins of the pleotelson.

Acknowledgments

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